RAILROAD GAZETTE

FRIDAY, OCTOBER 4, 1878.

Semaphore Signals.

Herbert Spencer has written "that an essential character of advancing science is increase in *definiteness*." It might, on the same principle, be said of railroad signals that *definiteness* is an essential character of their improvements. Any one who has been at all observant of the system, or rather want of system, in the signals in use on different lines of railroad in this country, will be struck not only with their remarkable *indefiniteness*, but the diversity and even contradictory characteristics of those in use. As a correspondent of the *Railroad Gazette* wrote some months ago:

"Not only is this true of hand signals, but of train and fixed signals. In the forms of targets in use there is about as much diversity as in the shape of the leaves of different kinds of forest trees. Semaphores in great variety of shape and action are used—balls which drop and arms which rise, flags and banners of various colors are used, so there is about as much confusion in this important language of railroad pantomime as there was among the bricklayers of Babel after the confusion of tongues."

Now, there is no language whatsoever in the use and purposes of which does *definitness* appear to be of so much importance as in that by which instructions are conveyed to locomotive runners while they are engaged in their perilous work. The meaning of the language should be as little liable as possible to be mistaken. Of course the greater the traffic on any line, that is, the more trains that are run, the greater becomes the danger of collisions and the importance of having effective signals. In Europe the condition of things on their lines has been reached much earlier and to a greater degree than on our lines, and for this reason the attention of railroad engineers has been occupied much more with the development and perfecting of signals than has been the case here. After years of experience the superiority of the semaphore signal over all other kinds for mainline signals has come to be recognized, and they are now, we believe, almost exclusively used, especially in England. In this country unfortunately, the merits of that kind of signal are not so generally known, and a large proportion of the unreading class of railroad officials do not even know what a semaphore signal is. For these reasons we have procured a working drawing of a single and double semaphore signal, as manufactured by Saxby & Farmer in England, an engraving of which we publish in this number of the *Railroad Gazette*, so as to show clearly to American railroad men the form and construction of such signals and the practice and method of construction in use in England.

From the engravings, figs. 1 and 2, it will be seen that the semaphore consists of a board or arm, *A*, about 5 ft. long and 10 in. wide, attached to a post by a pivot or shaft, *a*, so that it can be raised out horizontally as shown in fig. 1, or lowered, or hang vertically so as to be hidden by the post. The first position means "STOP" or "DANGER"; the second, "LINE CLEAR" or "GO AHEAD."

The post of the signal represented by fig. 1 is about 20 feet high, although the height depends upon the locality of the signal. The semaphore is operated by a crank, *b*, attached to the shaft *a*. To this crank a rod, *r r r*, is attached, and connected to a weighted lever *C D*. A wire rope, *C c*, is attached to the end of the lever and is connected by a suitable pulley to a switch lever or other means of operating the signal. At *L* a lamp is placed on a suitable bracket, and opposite the lamp an iron frame with a red glass, represented by cross lines, is attached to the post by a pivot or shaft, *d d*. This iron frame is somewhat of the form of an eye-glass, and is therefore called a spectacle frame. It is connected to the rod *r r r* by a pin or stud at *e*. When the semaphore is raised at right angles to the post, as shown in fig. 1, the spectacle frame is in such a position as to bring the red glass immediately in front of the lamp, and therefore at night shows a red light; but when the rod *r r r* is raised so as to lower the semaphore the spectacle frame is also raised and the red glass is removed from in front of the lamp, and therefore the latter shows a white light at night.

Before describing the details of construction of the semaphore more fully, its advantages over other signals will be pointed out. In the first place this form of signal seems to conform to the natural gestures which we employ in trying to arrest attention or to induce any one to stop. If a person is about to leave another the natural impulse of the latter in trying to detain the former is, to extend his arm and thus make a gesture which resembles somewhat that of a semaphore raised to the horizontal position shown in fig. 1, which means "STOP" or "DANGER." When the semaphore hangs vertically and is concealed by the post it means "LINE CLEAR" or "GO AHEAD."

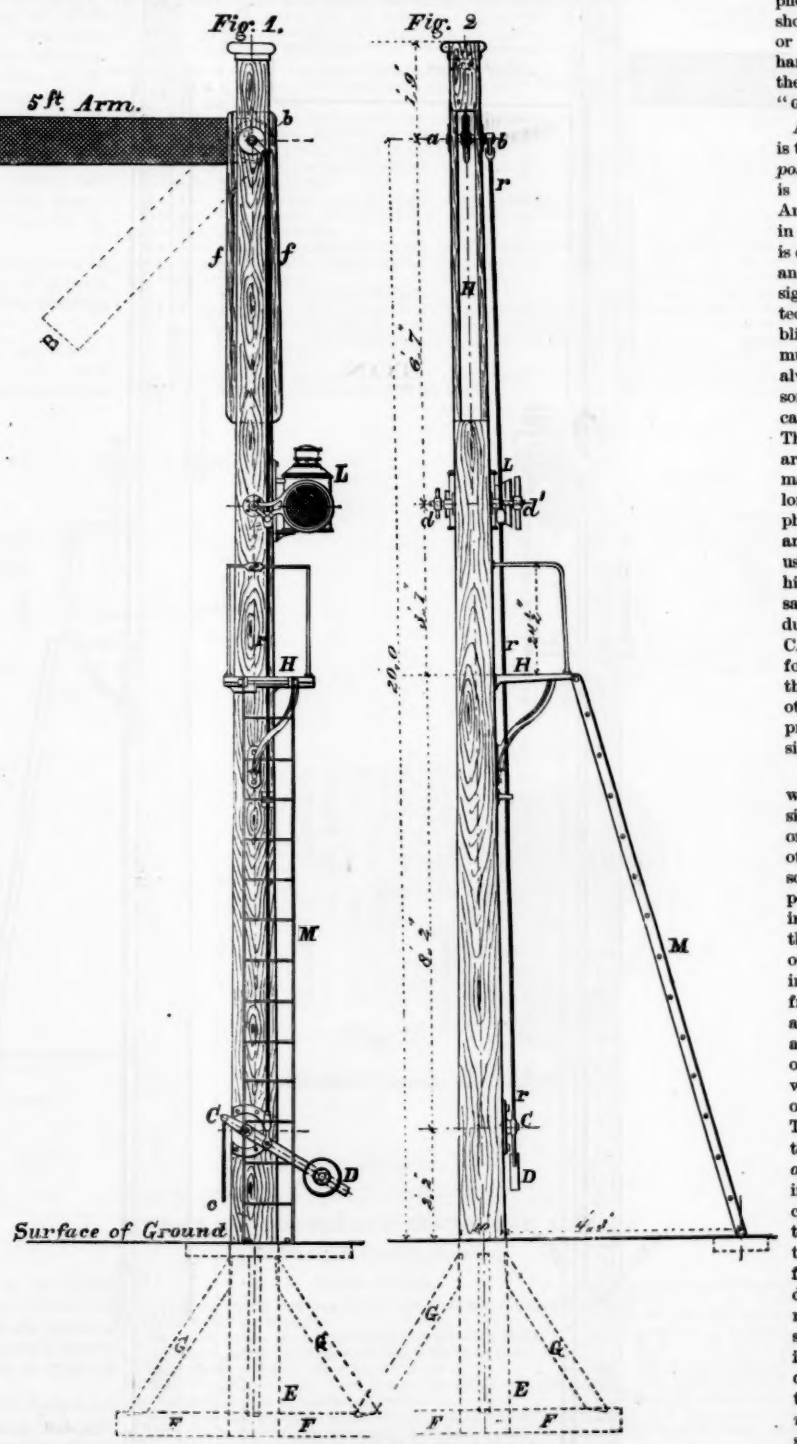
Another feature which commends it is that its significance depends upon its *position* and not in its color alone, as is the case with many disc signals. Any one with experience knows that in certain conditions of the weather it is difficult to distinguish one color from another in day time, especially if the signal is placed behind a glass for protection from rain and wind. Color-blindness is another element which must be considered, and which is not always due to organic defects but is sometimes produced by temporary causes, such as illness or intoxication. There is something about a projecting arm extending from a post which makes it more easily observed, even at long distances, and when the atmosphere is more or less obscured, than any other form of object which can be used for a signal, and Mr. Barry, in his book on "Railway Appliances," says: "The semaphore signal, introduced on railways about 1841 by Mr C. H. Gregory, has, however, been found so superior to all other types, that it is rapidly superseding all the other signals, and before long it will probably be the only daylight fixed signal used in England."

To avoid confusion and mistakes which might result from mistaking a signal intended for trains running in one direction by those running the other, semaphores are always placed so as to appear on the left side of the post to the trains for which they are intended. A signal like fig. 1 can therefore be used for trains running in one way only. When trains running in both directions must be signaled from the same place, double semaphores are used, one on each side of the post, as shown in fig. 8. The semaphore on the left of the post governs trains which approach it from the position of a person looking at the engraving. The semaphore which is on the right of the post in the engraving of course *appears* on the left to trains approaching in the other direction, so that all confusion or danger of mistake from this cause will be avoided. At junctions, when trains on two or more different tracks, all running in the same direction, must be signaled, two or more semaphores are placed on the same side of the post, the top one applying usually to the main line and the one or more below to the branches. In this way the most absolute *definiteness* is obtained and the language of a semaphore signal is unmistakable to any one who gives it attention.

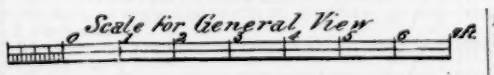
In addition to the fact that its *position alone* determines its meaning, it may besides be painted red on the side which faces the approaching train, which indicates "STOP" or "DANGER," and the opposite side white so as to appear less prominent. If the semaphore is then raised to a horizontal position, it shows red to the approaching train, whereas, when it is lowered, it is hid by the post, which may be of any other color.

In the signals represented in the engravings, cheek pieces *f f* are attached to the posts so as to completely hide the semaphore when it is lowered.

Besides the signals of "STOP" and "GO AHEAD," a third signal of caution is sometimes employed. This is indicated



SINGLE-ARM SEMAPHORE SIGNAL;
By Saxby & Farmer, London.



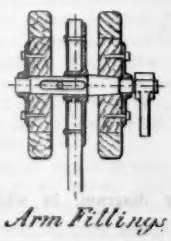
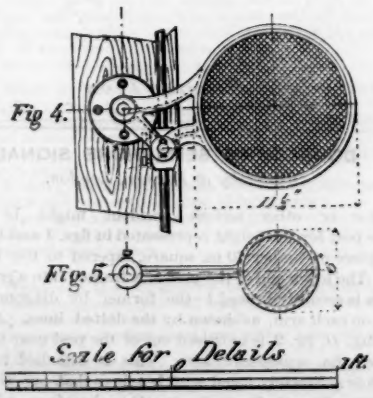
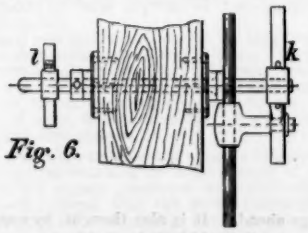


Fig. 3.



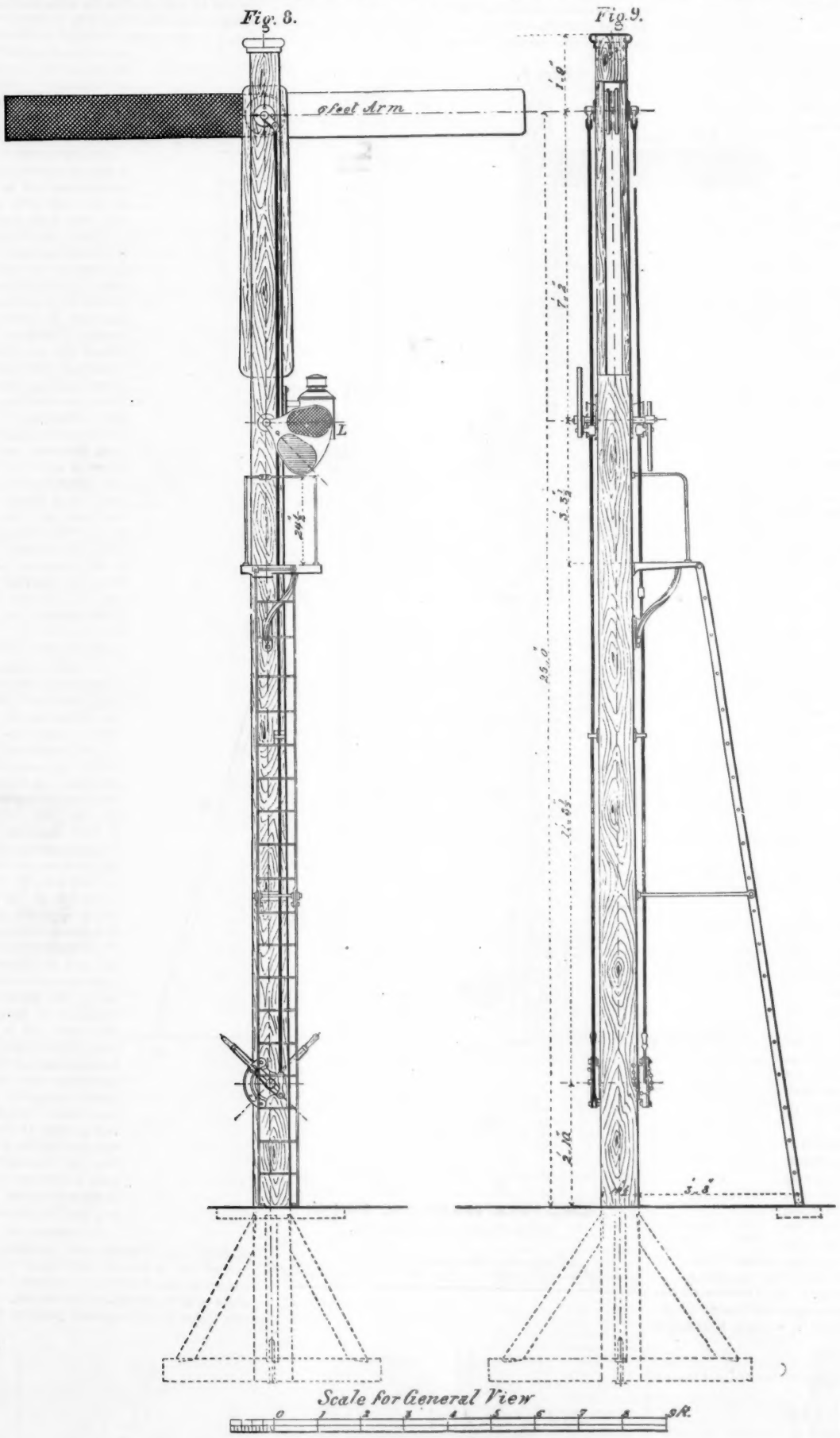


with a semaphore by lowering it at an angle of 45 degrees, as shown by the dotted lines at *B*, fig. 1. This signal is now, however, being gradually discarded, the idea being that a signalman should always know whether the line is clear or not. If he knows that it is clear he can give the proper signal, but if he gives a "caution" signal he is saying in effect, "I am not sure whether the line is clear or not, but you can go ahead." It is also thought by some managers that "line clear" should be indicated by some positive signal and not merely by the absence of one, and therefore they recommend that instead of lowering the semaphore so as to be entirely hid to indicate line clear, it should be placed at an angle of 45 degrees, or perhaps lower, but not so far as to be invisible when lowered to indicate "line clear," and that no "caution" signal be used. The latter undoubtedly is the safest system on all crowded lines.

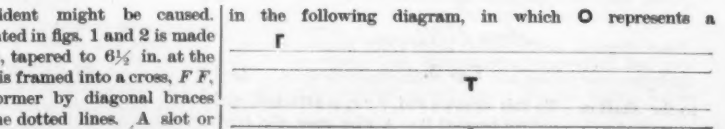
The details of the drawing, which we give are worthy of careful study. It will be seen that the lever to which the vertical rod *r r r* is attached is counterweighted, so that in case the wire rope, *C c*, or its connections should break, it will throw the semaphore up so as to indicate danger. In case of such an accident, the worst result which would follow would be that trains would be detained, whereas, if the semaphore should fall so as to indicate "line clear," a collision or other serious accident might be caused.

The post for the height represented in figs. 1 and 2 is made of a piece of timber 10 in. square, tapered to 6½ in. at the top. The lower end of the post *E* is framed into a cross, *F F*, which is securely braced to the former by diagonal braces *G G*, on each arm, as shown by the dotted lines. A slot or opening, *H*, fig. 2, is mortised out of the post near the top to receive the semaphore arm. This is attached to a shaft which is accurately fitted with bearings that are riveted to the arm. The shaft works in other bearings which are bolted to the post by lag screws, as shown in fig. 3, which is a horizontal section through *a b*, fig. 2.

The form of signal represented by figs. 1 and 2 is commonly used as a distant signal, and is operated by a lever and wire rope or rods connecting the signal with a lever located at a junction or turn-out. In such cases the arrangement is usually somewhat like that shown in the following diagram, in which O represents a signal station, and the inverted Γ Γ semaphore signals. These are intended to govern trains which are approaching the station from each direction, and consequently



DOUBLE-ARM SEMAPHORE SIGNAL;
By Saxby & Farmer, London.



the signal lamp must face *from* the station, and therefore at night is not visible to the signalman. In that case it would be impossible for him to tell whether the lamp was burning, and therefore a small opening is made in the back of the lamp, through which the light becomes visible to the signalman. In order that he may know that the signal is working properly, a spectacle frame, shown in fig. 5, is attached to the shaft on which the main spectacle frame is fastened. The former has a different colored glass—usually green or blue, represented by parallel lines in fig. 5—and is worked simultaneously with the latter. When the semaphore is lowered to "line clear," and the light at night would appear white to approaching trains, the back light, as it is called, would also appear white, but when the semaphore is raised and the light appears red, the color of the back light is also changed, so that the signalman can always tell whether the light is burning, and also whether the signal is working properly. The details of the arrangement of the spectacle frames is shown clearly by figs. 4 and 6. Fig. 4 is a front view of the main spectacle frame, and fig. 6 a side view, showing the attachments of both spectacle frames, *k* being the main frame, and *l* the frame for the back light.

An iron platform or gallery, *H*, is attached to the post below the lamp, which can be reached by a ladder *H*, communicating with the ground. The construction of the platform is shown in detail in fig. 11.

Double semaphores like that represented by figs. 8 and 9 are generally used as home signals, that is, they are placed near the signal station as shown by **T**, in the above diagram.

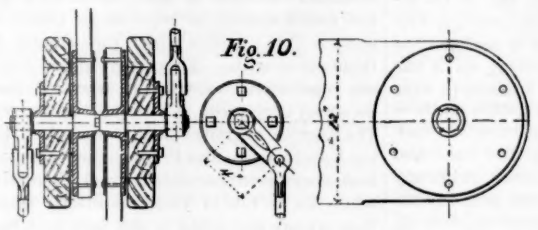
In such localities the back light is not needed, as the signal man can see whether the lamp is burning and whether his signals are working all right. In such cases the one lamp may be used for both signals by having spectacle frames with colored glass on each side of the lamp as shown in fig. 9.

"It is an advantage"—to quote from Barry's book again—"not to have to use a white light for signaling 'all right' in or near towns, when such a light may be confused with ordinary lights." In such places a double spectacle frame, like that shown at ⊥ in figs. 8 and 13, is used with two openings, one of them with a red glass, which is represented by shading with cross lines, and the other has a blue or green glass, which is represented in the engraving by shading with one set of parallel lines.

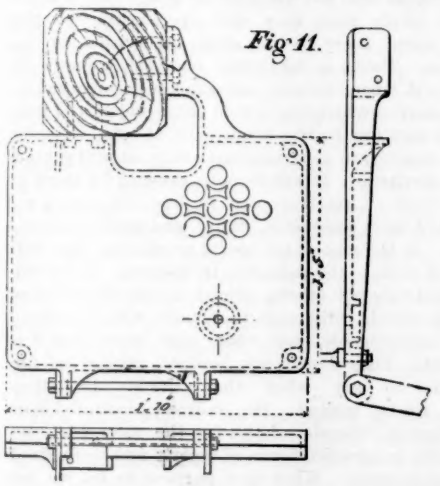
The details of the double semaphore are shown so clearly by figs. 8 to 14 that no further description is needed. Special attention is, however, called to the skillful manner in which all the details of these semaphores have been worked out by Messrs. Saxby & Farmer. They indicate the employment of mechanical skill of a very high order, and a refreshing absence of that kind of slovenly work which is so characteristic of nearly all the signal work in this country, and which needs reform so sadly.

Some uniform code of signals is very much needed here, where there is now so much confusion. The adoption of semaphore signals similar to the illustrations for all main-line signals would at once give simplicity to what is now confusion and sometimes contradiction. It could be used for all main-line signals, switches, crossings, bridges, junctions and wherever fixed signals are needed to stop trains—it being understood that wherever an extended semaphore arm is displayed it means "STOP."

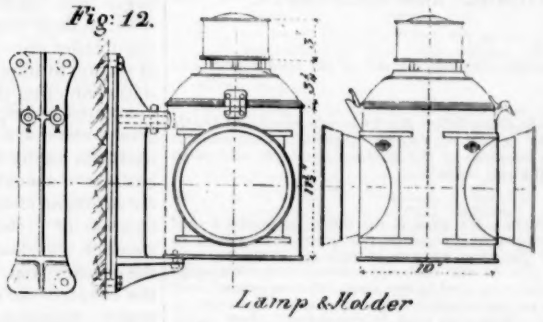
The Toucey & Buchanan Switch and Signal Company, of Harrisburg, Pa., is the owner of Saxby & Farmer's patents in this country, and is prepared to furnish semaphore signals similar to those illustrated herewith.



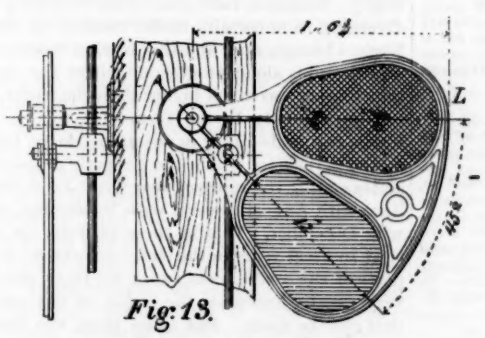
Arm Fittings, Spindle, Crank, &c



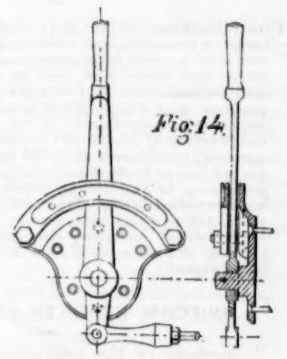
Gallery



Lamp & Holder



Double Spectacles, & Fittings



Hand Lever &c

DETAILS OF DOUBLE-ARM SEMAPHORE SIGNAL;

By Saxby & Farmer, London.

Best Form and Material for Locomotive Wheels and Axles.

[Committee Circular of the American Railway Master Mechanics' Association.]

To Members of the Master Mechanics' Association:

The undersigned were appointed a committee to investigate the subject of "the best form and material for locomotive wheels and axles."

In order to obtain the necessary information from which to make this report they would respectfully solicit replies to the following questions, and at the same time urge all the members to make prompt and full replies, as upon them depends the nature of our report.

Engine Trucks.

1st. How many engines have you equipped with cast-iron wheels in engine truck?
2d. How many with cast wheel-centres and steel tires?
3d. How many with cast wheels with steel faces?
4th. Have you any other kind in use?
5th. How do these compare for first cost and for cost of maintenance per mile run?
6th. For this purpose, please state what description of wheels you recommend, and whether you prefer spoked, single or double-plate wheels.
7th How many wheels of each kind have broken in service in the past two years in engine truck; state also (if known) the cause of breakage?

Driving-Wheels.

1st. What kind of wheel-centre do you recommend for driving-wheels? Hollow spokes with hollow rim and nave or hub, or solid spokes with solid rim and hub, or solid spokes with hollow rim and hub?
2d. Please state if you have had any wheel-centres broken within the past two years, and of what kind?

Tender Wheels.

1st. How many engines have you that are equipped with cast-iron tender wheels?
2d. How many with cast centres with steel tires?
3d. How many with cast wheels with steel faces?
4th. Have you any other kinds in use?
5th. Which gives the best result in miles run, including first cost and cost of maintenance?
6th. For this purpose what wheels would you recommend?
7th. Have any tender wheels broken in the past two years? If so, please state the kind and cause of breakage?

Truck Axles.

1st. What are your standard sizes for journals for engine truck axles on engines of 16×24 in. cylinders? give also size of wheel-seat.
2d. How many engines have steel and how many have iron axles in engine truck?
3d. Which gives the best results considering first cost, wear of journals and brasses and cost of lubricants?
4th. Which gives the best results, iron or steel, all things considered, and what dimensions would you recommend?
5th. Have any engine truck axles broken in the past two years? If so, please state kind and cause.

Driving-Wheel Axles.

1st. What are the dimensions of driving-wheel axles for American engines 16×24 in. cylinders? Give size of journals, wheel-seat and centre of shaft, and whether straight or tapering to the centre.
2. How many engines have you with steel and how many with iron axles?
3d. Which gives the best results, considering first cost, wear of journals and brasses and costs of lubricants?
4th. Have any axles broken in the past two years? If so, please state what kind and what part of the axle broke first. If convenient, send sketch.

Tender Axles.

1st. What are the dimensions of your standard tender axles, including size of journal, length of axle, size of wheel seat and diameter of axle in centre?
2d. How many tenders have iron axles; how many have steel axles?
3d. Which gives the best results, all thing considered?
4th. Which would you recommend for axles, iron or steel, and what in your opinion are the best dimensions for this purpose?
5th. How many tender axles have broken in the past two years, and of what kind?

Valuable Suggestions.

Please give any information which you may have that will help the committee in making up their report; they will be pleased to receive tracings (on small scale) of standard axles for engines, tender and engine trucks.

Replies to the foregoing questions are solicited before March 1, 1879, and should be addressed to ROBERT KING, Master Mechanic Western Railroad of Alabama, Montgomery, Alabama.

Yours, respectfully,
ROBERT KING, Western Railroad of Alabama.
WILLIAM RUSHTON, Atlantic & West Point Railroad.
JAMES MAGLENN, Carolina Central Railroad.

Best Form and Proportions of a Standard Car and Tender Axle.

[Committee Circular of the American Railway Master Mechanics' Association.]

To Master Mechanics, Master Car-Builders and others interested in the Construction and Maintenance of Railway Rolling Stock:

At the last annual meeting of the Railway Master Mechanics' Association, on motion of Mr. Forney, of the *Railroad Gazette*, it was voted: "that a committee be appointed to confer with the master car-builders, or any other parties, regarding the best form and proportion for a standard car and tender axle, and that the committee report to this Association at the next annual meeting."

In accordance with the above, the undersigned were appointed such committee and present the following:

The desirability of a car and tender axle of standard dimensions, since the interchange of traffic and equipment has become so general, must have impressed itself strongly upon every one interested; it has become an urgent necessity.

If it can be clearly demonstrated what size of axle will best perform the service required, taking into consideration cost, wear, economy of power, etc., there will be little hesitancy on the part of any railroad company to adopt such size as the standard, and work in conformity therewith.

In furtherance of this object your committee ask for your earnest consideration of the subject presented.

For purposes of tabulation your committee solicit replies to the following questions:

1st. How many cars have you in service? Freight..... Passenger.....Total.....
2d. How many engines?.....
3d. Please give as carefully as possible the number of each, with the different (described) dimensions of axles.
4th. What size of axles has given you the best results? Include, if you have such, statistics substantiating the same.
5th. Please give the dimensions of axle for which you have a preference, with reasons for such preference; if preference is substantiated by facts proven, or tests made, please give memoranda in full.
6th. Would you prefer an axle 83 in. long over all, 82 in. between outside collar, wheel seat 4⅝ in., with journals 3¼ × 7 in. weighing about 350 lbs.; or would you prefer that now known as the Master Car-Builders' standard: 83¼ in. long over all, 82 in. between collars; journals, 3¾ × 7 in.; forged size of axle, 5 in.; diameter at wheel-seat, 4⅛ in.; forged weight, 350 pounds.

It is not worth the trouble and expense necessary to make a series of careful tests and give the results of such in furtherance of the object presented by your committee? It should be remembered that the present time of the year is the best adapted for conducting tests of this nature. An early reply in detail is respectfully solicited.

JAMES SEDGLEY,
H. L. COOPER,
J. M. BOON,
W. S. HUDSON,
M. N. FORNEY. } Committee.

Replies may be addressed to JAMES SEDGLEY, General Master Mechanic, Lake Shore & Michigan Southern Railway, Cleveland, O.

RAILROAD GAZETTE

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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

	Page.
ILLUSTRATIONS:	
Semaphore Signals...477, 478, 479	
CONTRIBUTIONS:	
The Cheapness of Narrow-Gauge Railroads	483
Proposition to adopt a Uniform Freight Car....	483
EDITORIALS:	
Uniform Reports and Accounts.....	480
Claims for the Narrow Gauge.....	480
"Differential Tariffs" in Germany.....	481
Record of New Railroad Construction.....	482
EDITORIAL NOTES.....	482
GENERAL RAILROAD NEWS:	
Meetings and Announcements.....	483
GENERAL RAILROAD NEWS:	
Elections and Appointments.....	484
Personal.....	484
Traffic and Earnings.....	484
The Scrap Heap.....	485
Old and New Roads.....	485
Locomotive Returns	488
ANNUAL REPORTS:	
Indianapolis, Cincinnati & Lafayette.....	487
Northern Pacific.....	488
MISCELLANEOUS:	
Best Form and Material for Locomotive Wheels and Axles.....	479
Best Form and Proportions of a Standard Car and Tender Axle.....	479

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

UNIFORM REPORTS AND ACCOUNTS.

A meeting of the railroad commissioners or other officers of states that require yearly reports from railroad companies has been appointed to be held in Columbus, Ohio, on the 12th inst., to consider the adoption of a uniform system of accounts and reports. Most of the important states of the North now require reports, and the number has increased materially within a few years. Of the states north of the Ohio, only the following now require no report of operation, and some of these have other reports: Maine, New Hampshire, Vermont, Delaware, Maryland and Indiana. New Jersey requires only a very brief report, giving little more than capital stock, funded debt, earnings and expenses, made to the State Comptroller chiefly for the purpose of basing assessments for taxation. But nearly all the great railroad states of the North now publish separate railroad reports of one kind or another, generally under the supervision of some officer or officers specially appointed for that purpose, though in some cases he exercises scarcely any discretion as to the matter to be reported or the manner of its presentation.

Now it needs not be said that the reports will be more valuable to all concerned if made upon a uniform model. A large number of companies have lines or parts of lines in several states, and it is next to impossible to give a report covering only the mileage in a single state, and would be useless if it were possible. The Lake Shore & Michigan Southern, for instance, has railroad in six different states, and with the exception of some branches, no entire line, forming a unit for operation, in any one state. The Chicago & Northwestern's lines extend over five states and one territory. It can report the part of its road in Michigan separately, perhaps, but no other part of its property in a single state forms anything like an independent line or system. This has been recognized by the state authorities to whom reports are made, who accept a report for the whole road or system of roads of a company, without further reference to their particular state than a statement of the mileage within it and sometimes a statement of items of accounts in proportion to that mileage, which, however, may not in the remotest degree represent the capital, earnings and expenses actually due to the part of the road in that state. Imagine, for instance, Dakota, with 38½ miles of the Chicago & Northwestern on which until recently no trains were run, and which we may be sure has no expensive structures, credited with earnings, etc., in proportion to this mileage. And the whole general statement of average cost, traffic, earnings, expenses and rates for a state is often made entirely deceptive in this way. For instance, with the Illinois roads are counted the Michigan Central, the Lake Shore & Michigan, the Pittsburgh, Fort Wayne & Chicago, the Pittsburgh, Cincinnati & St. Louis, and the Baltimore & Ohio—all great lines with a heavy traffic, which have but a very few miles of road in Illinois, yet add to the aggregate reporting to that State more than three thousand miles of road, including some with perhaps twice as great a traffic as any railroad really in Illinois. This is a trouble, however, that cannot be avoided in state reports, which attempt to take cognizance of institutions which are larger than the states themselves, and are in no respect, in their working, state institutions, though credited under state laws, and subject not to national but (if to any) to state control. It is something as if the states bordering the great lakes or the Mississippi were to attempt to keep accounts of the navigation on those great water-ways. But though the reports of the railroads can hardly be made to represent the lines and business of a single state, they can, if made uniformly for adjoining states, be made to represent properly the business of systems of railroads, and, if made in all states on one plan, to represent the railroad business of the country and of great, closely-related sections of the country—as of New England by itself (pretty nearly), Southern railroads, Texas railroads, railroads diverging from certain traffic centres, as Boston, St. Louis, Chicago, etc., and this is what would be really useful, and is alone practicable where the transportation lines are so much bigger than the states.

Now not only do the forms for reports—the materials required—differ in adjoining states, but so also do the periods for which these reports are made—some states ending the railroad year with June, one we believe with August, several with September, and some with December. That is, there is about as much variety in fiscal years in the state reports as in the reports of the several companies to their stockholders, very greatly lessening the value of any comparisons that may be made. But aside from the value of the reports, what enormous and useless labor must be caused to the company which must make detailed reports for two, three or four years within a single year.

But the meeting to be held in Columbus contemplates not only uniformity in years and in the forms of reports, but also the requirement of uniformity in some of the details of the accounts on which the reports are to be based. Certainly to a certain extent this is necessary if the reports are to be intelligible and capable of comparison. If one company charges to working expenses what another charges to capital, there is no comparison possible under that head. If there is a separation of freight and passenger expenses, one rule for the division of maintenance and many other expenses between passenger and freight traffic must be followed if the same item in the different reports is to mean the same thing. It is by no means necessary for this that the accounts of all railroads should be kept in the same way, but only that the same general principles should be followed in making up the statements of the different items required in the report.

The danger now seems to be that a uniform system will be adopted without sufficient discussion as to its usefulness, practicability and desirability, and, we may add, as to its superfluousness; for in this matter there is danger of doing too much as well as too little. And it is not likely that a good system will be adopted unless the railroad companies themselves take part in forming it. It is doubtful whether in any other country of the world an attempt would be made to design a system of railroad accounts and returns without calling in the railroad companies for consultation; and it is pretty certain that in any other civilized country, with the possible exception of England, the government officials are better qualified of themselves to plan such systems. And this we say without any reflection on the capacity of any officials, here or in England; but because in all or nearly all continental countries the governments themselves have, and need to have, officials or employés who are experienced in railroad business and experts in railroad accounts. Yet countries where there are armies, as it were, of such officials scarcely ever venture upon any measure affecting the railroad companies without first calling upon the latter to send representatives to a conference, and it may be only after long discussions that a measure is finally adopted, which measure, very likely, is reported by a committee composed of both railroad representatives and officials; or is almost wholly prepared by the railroads, and adopted, with modifications, perhaps, by the government. There, it seems to be taken for granted that every effort must be made to adopt a policy acceptable to the representatives both of the community and the railroads. Plans are presented, withdrawn for modification, amended by one party and the other, and when finally agreed upon are likely to contain the least matter possible objectionable to the companies, while still fulfilling the purposes aimed at by the authorities: for we would not have it understood that the railroads always have their own way. They have to submit to the inevitable, but they know it, accept the condition, and work openly, zealously and effectively to make the inevitable requirements as useful and harmless as possible to themselves.

Unfortunately, the railroads in this country, like the officials themselves in many cases, seem to think that the establishment of regulations under which they must act is a matter which they should not concern themselves with. They may oppose the making of any regulations, but when it is settled that there will be some, they seem to concern themselves no longer. The exercise of government control in this direction has been so recent and in the earlier cases so incomplete, that they have not familiarized themselves with it, while not a few of them are utterly impatient of it. Now we are not going to say here how they ought to feel about the making of state reports, state supervision of accounts, etc., but will venture to say that it is not at all likely that they will ever again see the time when there is no state supervision or inspection. There is no other civilized country in the world where there is not some such supervision, and countries which begin it do not abandon it. Little as they may like it, the companies, at least, in states where reports are now required, may as well submit to the inevitable. It will be only rational for them to make what efforts they can to have the reports required of them reasonable, simple, and useful to themselves. If the reports are useful to any one, they will be most of all to the railroads themselves. Their officers (and very few others, official or unofficial) know what is useful. Still more, they know what is useless, what impracticable, and what costs more than it is is worth. They should not hesitate, invited or uninvited, to say what they think. But they ought to be invited. The railroad commissioners who meet at Columbus have, for the most part, no authority to establish forms of reports and methods of account-keeping. What they purpose to do, we believe, is to recommend some uniform system to their respective legislatures; and if they agree upon one, doubtless their recommendation will have a great influence. If now they would call upon the companies to send representatives, after discussion appoint from their own number and from these representatives a committee to prepare a system, and, after submitting that to general criticism, submit it, if acceptable to themselves, to the legislatures, there would be good reason to hope that it would be valuable and practicable, and, probably, it would almost surely be adopted.

CLAIMS FOR THE NARROW GAUGE.

On another page a letter from Mr. Joseph Ramsey, Superintendent and Engineer of the Bell's Gap Railroad, is printed, in which he makes reply to some comments published in the *Railroad Gazette* of Sept. 13, in a letter written by him to a local paper. The most important statement made in Mr. Ramsey's communication this week is, that "it is a fact, capable of practical demonstration, that the friction on curves, of the same radius, is much greater with a 4 ft. 8½ in. gauge than the friction of a 36 in. gauge. *We must take curves for each gauge upon which the friction will be equal*, and I find this to be as 10 to 16; that is, a 10-degree curve on a broad gauge will produce the same amount of friction as a 16-degree curve will on the narrow gauge." It will be noticed that there is in this quotation a statement of fact, viz., that the friction—which, we suppose, means the resistance of the cars—on curves of the same radius is *much greater* on a 4 ft. 8½ in. than on a 3 ft. gauge, and an inference therefrom, which we have italicized. It will be noticed that the fact is entirely unsupported by evidence, and rests wholly on the assertion of our correspondent that "it can be demonstrated;" therefore, it is quite

proper to present evidence to show that the assumed fact is not true, and that any reasoning based on it rests on false premises.

The only reason ever assigned for the difference in resistance on curves on roads with different gauges is that the difference in the length of the inner and outer rails is greater when they are far apart than when they are near together, and therefore the wheels on one side must slip over a greater distance in the one case than in the other. This subject was examined in an article published in the *Railroad Gazette* of Aug. 25, 1876, from which the following paragraph is reprinted:

"Let us take a curve of 300 feet radius, than which there are very few shorter, even on narrow-gauge roads. The circumference of a complete circle of 300 feet radius would be 1,884.96 feet. It is a well-known fact, which can be easily proved geometrically, that the difference in the length of two rails in a complete circle of a curve of any radius, is equal to the circumference of a circle whose radius is the gauge. Therefore, the difference in the length of the rails in a complete circle of 300 ft. radius, if the gauge is 4 ft. 8½ in., will be 29.58 ft., and on a 3 ft. gauge, 18.84 ft.; so that the difference would be 10.74 ft.; or, in other words, the wheels on one side must slip 10.74 ft. farther on the wide than on the narrow gauge. It must be remembered, however, that it is only the wheels on one side which must slip, so that for every ton (of 2,000 lbs) of weight carried around such a curve, a load of half a ton must slide a distance of 10.74 ft. Now to slide a wheel on a rail requires a force of about one-fifth the weight, so that the difference in the power absorbed in sliding the wheels on the one gauge as compared with the other will be for each ton of load one-fifth of 1,000 lbs = 200 lbs. As already stated, the total difference in the distance which the wheels must slide in running around the whole circle or 1,884.96 ft. is 10.74 feet., so that the actual difference in the power which must be exerted at any one time to draw each ton on the curve named on the one gauge as compared with the other is

$$\frac{10.74 \times 200}{1{,}884.96} = 1.1 \text{ lbs.}"$$

In a paper by Mr. S. Whinery, C. E., read before the American Society of Civil Engineers, and published in the April number of the *Transactions*, the author says that in a 10-degree curve "*by reducing the standard to a three-feet gauge, we reduce the train resistance* 3.8 *per cent.* This conclusion is of interest, in view of the claim made by zealous advocates of the narrow gauge, that short curves are much less objectionable on roads of narrow than of standard gauge." So eminent an authority as Mr. Albert Fink stated to several engineers that the difference in the resistance due to a 3 ft. gauge as compared with one of 4 ft. 8½ in. was so slight that it would require a very delicate dynamometer to detect it. Mr. Dudley, who made some experiments on the standard and on the 6 ft. gauge with his dynagraph, also stated that the difference in resistance on curves of the same radius is extremely small.

In a paper read at the Convention of Master Mechanics in 1873, by Mr. Reuben Wells, and published in their report of that year, page 164, he says: "On a curve of 300 ft. radius, at a speed representing 5.76 miles per hour, the advantage in hauling power was *eighteen and one-quarter* per cent.; at 7.59 miles, *fourteen and one-half* per cent.; at 10.12 miles per hour, *nine* per cent.; and at 16.70 miles, only *five* per cent. in favor of the three-feet gauge."

But even taking Mr. Ramsey's figures, the difference in the resistance on steep grades is not very great, and these grades always govern the movement of trains. Thus he says that the resistance on a 10-degree curve on a standard gauge is equal to that on a 16-degree curve on a 3 ft. gauge. Now, on a straight and level line the resistance at moderate speeds is about 8 lbs. per ton, and, according to the experiments of Mr. Latrobe on the Baltimore & Ohio Railroad in 1844 and of Zerah Colburn on the Erie in 1854, and by Mr. Chanute on the same line quite recently,* the resistance due to curves on a standard gauge was shown to be about ½ lb. per degree. Therefore, on a 10-degree curve on a 4 ft. 8½ in. gauge, the resistance would be 8 + 5 = 13 lbs., and, according to Mr. Ramsey, on a 16-degree curve on a narrow gauge the resistance would be the same. Therefore, deducting the resistance on a straight line, or 8 lbs., we have 5 lbs. as the resistance due to the curvature alone of a 16-degree curve on a narrow gauge, according to Mr. Ramsey's data. This would give us 0.31 lbs. per degree as the resistance due to narrow-gauge curves, instead of half a pound on the standard gauge. The difference therefore is 0.5 — 0.31 = 0.19 lb. Now let us see what this difference will be when curves of 16 degrees occur, as they usually do, simultaneously with grades. For this purpose the following table has been worked out, which gives, according to Mr. Ramsey's figures, the difference in resistance on the two gauges:

* See *Transactions* of American Society of Civil Engineers for April.

Table showing the Resistance of Cars on a Curve of 16 Degrees on a Standard and on a 3-ft. Gauge Road, on Different Grades at a Speed of 20 Miles per Hour.

Grade: Rise in ft. per mile.	Standard gauge.	3-ft. gauge.	Difference in percentage of the resistance on the standard gauge.
0	16.0	12.96	19.0 per cent less.
10	19.7	16.66	15.4 " "
20	23.5	20.46	13.0 " "
30	27.3	24.26	11.1 " "
40	31.1	28.06	9.8 " "
50	34.9	31.86	8.7 " "
60	38.7	35.66	7.8 " "
70	42.5	39.46	7.1 " "
80	46.3	43.26	6.5 " "
90	50.0	46.96	6.0 " "
100	53.8	50.76	5.6 " "
150	72.8	69.76	4.2 " "

It will be seen then that from his own figures the resistance on a road with curves of 16 degrees and grades of 50 ft. per mile is increased only 8.7 per cent.; with the same curves, and grades of 100 ft., the increase is only 5.6 per cent.; and on his road, which has grades of 154 ft., the increased resistance would be only about 4 per cent. It is true that there are curves of 27½ degrees, but we do not know whether these occur simultaneously with the grades of 154 ft. If they do, then the resistance would be about 7¼ per cent. greater at these points if his line had been made of a standard gauge than it now is, according to the assumed data. Now this increased resistance means that the train-loads must be diminished by the same percentage, and somewhat higher train expenses, including consumption of fuel, be incurred. The train expenses are about 30 per cent. of the operating expenses, so that if they are increased in the same proportion as the loads are diminished, if the latter is 4 per cent. the increase of operating expenses would be $0.30 \times 0.04 = 0.012$; if it is 7¼ per cent., the increase would be $0.30 \times 0.0725 = 0.022$ per cent. It must be kept in mind that this is the result reached by using Mr. Ramsey's own figures. If we take the data which are given by calculations, instead of having a difference in the resistance of standard and narrow-gauge trains equal to 0.19 lbs. per degree, we have on a curve of 300 ft. radius = 19 degrees a resistance, due to the difference in gauge, of 1.1 lbs., or $\frac{1.1}{19} = 0.006$ lbs. per degree, which is only a little over three per cent. of what Mr. Ramsey gives it. Applying these figures to the problem, we find that on a level curve of 19 degrees the resistance would be on a standard gauge 8 + 9½ = 17½ lbs. per ton. On a similar curve on a narrow gauge it would be less by 1.1 lbs., or not quite 7 per cent. On a grade of 50 ft. per mile it would be 3 per cent. less; on a grade of 100 ft., 2 per cent.; and on one of 150 ft. per mile, 1½ per cent. less. These amounts are so small that in practice they are of no consequence. It must be kept in mind too that curves of 300 ft. radius are even on narrow-gauge roads very rare, and that the difference in the resistance diminishes as the radius increases. If the Bell's Gap Railroad had been laid of 4 ft. 8½ in. gauge with its present alignment the difference in the resistance would have had no influence on the traffic, unless the steepest grade is located simultaneously with a curve. The resistance due to the difference in gauge with a curve of 300 ft. radius is, as shown by calculation, equivalent to a rise of only about 3 ft. per mile, so that if the grades on a narrow-gauge road, when they occur on curves, are diminished only a few feet per mile, it will be more than equivalent to the very slight increase of resistance due to the gauge.

It must be remembered that the only expense incurred by an increase of resistance is that of the consumption of coal, provided the resistance at the ruling grade is not increased, and the train-loads consequently diminished.

It is a fact, too, that in order to keep the centre of gravity low, smaller wheels must be used on a narrow than on a broad gauge, and consequently greater resistance is incurred from that cause, for which no allowance has been claimed.

SHARPEST CURVES USED ON NARROW-GAUGE RAILROADS.

	Feet.
1 road reports that it has *no curves*.	
On 1 road the radius of the shortest curve is	2,000
" 1 " " " " "	1,910
" 2 roads " " " " "	1,000
" 4 " " " " "	from 900 to 1,000
" 2 " " " " "	820
" 5 " " " " "	600 to 700
" 5 " " " " "	500 " 600
" 7 " " " " "	400 " 500
" 11 " " " " "	300 " 400
" 7 " " " " "	200 " 300
" 7 " " " " "	100 " 200
" 1 " " " " "	65
6 roads do not report.	
60—total number of roads.	

Practical experience, however, affords the most reliable testimony concerning the soundness of any theory. It has been asserted so often that much sharper curves can be used on the narrow than on the standard gauge that it has generally come to be believed that such is the case in practice. In order to ascertain what really are the facts in the case, a circular was sent out to all the narrow-gauge railroads in the country, asking, among other things, "What is the radius of sharpest curves on the main line?" The answers to these inquiries are summarized in the previous table.

To show that just as sharp curves can be operated on the standard gauge as on a narrow gauge, we give the following list of the radii of sharp curves which are or have been in use on the main lines of standard-gauge roads:

SHARP CURVES ON STANDARD-GAUGE RAILROADS.

	Feet.
New York, New Haven & Hartford Railroad, at Springfield	410.0
Upper Divisions, Lehigh & Susquehanna	383.0
" " " at Stony Creek	320.0
" " " on Bath Branch	309.9
Baltimore & Ohio, at Harper's Ferry, Md. side	400.0
Baltimore & Ohio, at Ilchester	375.0
" " Harper's Ferry, Va. side	300.0
Oroya Railroad, in Peru	395.0
Virginia Central, over Rockfish Gap Tunnel	300.0
" " " " "	238.0
Pennsylvania Railroad tracks at Centennial	300.0
Pittsburgh, Fort Wayne & Chicago, in Pittsburgh	246.0
Canarsie & Rockaway, in Brooklyn	175.0
Brooklyn, Bath & Coney Island	55 to 125.0
Metropolitan Elevated Railway	90 and 103 5
New York Elevated	46, 100, 125 and 150.0
At Petersburg, Va., during war	50.0

We have called attention before to the fact that the Metropolitan Elevated Railway in New York is running 380 trains per day each way over its line—the largest number over any road in the world—with curves of 90 ft. radius. The New York Elevated is running all its traffic on its East Side line over curves of 100 ft. radius.

The last curve in the list is described as follows by Mr. C. L. McAlpine in the number of the *Transactions* of the Society of Civil Engineers already quoted from:

"The railroad bridge at Petersburg, over the Appomattox, had been burned. No connection at that place had ever been made in peace times, and the first examinations showed that heavy excavations, etc., requiring *time* (for which the Department never made allowance), *must* be made, before any reasonable connection with the Richmond line could be effected.

"Contrary to the advice of trackmen and bridge-builders a sharp curve was laid out, of more than one hundred degrees, with a radius of fifty feet, on what was to become the main line. * * * A very large traffic passed over this curve for months afterward, supplying the armies of occupation in Richmond and at other points to the southward, and no accident or trouble whatever was experienced at the place in question."

It may, it is thought, from these data be safely inferred that practically just as sharp curves can be used on standard as on narrow-gauge roads.

With reference to the cost of grading, a comparison would be much more satisfactory if Mr. Ramsey would give cross-sections of his line in a cut, embankment and on an ordinary hill-side and also on the steepest side hill. Hoping that he will do so, we defer any discussion of that portion of his letter until a future time. The question whether the resistance on curves on a standard-gauge road is "much greater" than on a narrow-gauge is a leading one in a discussion like this, and for that reason so much space has been devoted to it. It must be kept in mind though that a mere increase of resistance on a railroad, unless it compels a reduction of the train-load, is not attended with much expense in operating a line; and if sharp curves must be used, the necessity for a reduction of train-load can usually be avoided by reducing the grade at the curve below the maximum at other points. As we have pointed out, a reduction of grade of 3 ft. per mile on a curve of 300 ft. radius would make the resistance with a wide gauge equal to that on a narrow gauge.

"Differential Tariffs" in Germany.

The "Congress of Economists" which is held yearly in Germany met this year at Posen, in Prussian Poland, where the most important subject acted upon was that of "differential rates," as they are called in Europe, that is, rates lower for some traffic than for other on the same road and under similar circumstances. Two members of the Congress, Dr. Eras, of Prussia, and Dr. Sachs, of Austria, had been appointed to report upon the subject. These joined in the presentation of the following as general principles:

"1. The limitation of differential rates is justifiable only so far as to exclude positive discrimination in favor of foreign countries, or in favor of individual shippers (within the country) as against other shippers.

"Such a limitation is effectively attained by the requirement that on the same line of road in the same direction the total price of transportation of a given quantity of freight shall not be higher to a nearer than to a more distant station.

"In infrequent exceptional cases a deviation from this rule is unavoidable, as:

"*a.* In consequence of the competition of foreign transportation lines.

"*b.* When there are competing water routes.

"*c.* When the tariff of a certain road is governed by the lower regular tariff of another railroad connecting the same terminus, or, the case of seaport traffic, the same centre of traffic, with another port.

"It seems desirable to exclude the case designated under 'a' by international compacts.

"2. The hindering of the import or transit of foreign productions, caused by the circumstances affecting demand and prices, by stipulating higher freight rates for goods of foreign origin is decidedly to be condemned.

The gentlemen reporting these rules supported them by speeches in which they gave at some length the reasons why

differential rates cannot be prohibited. Dr. Sachs especially opposed the manipulation of railroad tariffs so as to make them serve as protective tariffs; if protection is aimed at, it should be through duties, and not under cover of railroad rates.

The Congress adopted an amendment to the clause under "1" of the report, substituting "in favor of certain places of production and commerce as against others," for "in favor of individual shippers (within the country) as against other shippers," and also the following additional clause:

"In the interest of the steady and healthful development of German railroad affairs, the Congress declares it to be urgently demanded that the government's interference with the establishment of railroad freight rates be subjected to legal regulation. For this purpose the supervisory power over the railroads should be transferred to an independent tribunal provided with judicial functions."

The report thus amended was adopted. There was a good deal of discussion at the Congress, but there seems to have been none who were willing to declare generally against differential rates, though there was a party, chiefly of landowners, who wished to declare particularly against differential import tariffs, which now help to bring foreign agricultural products, and especially American grain, into competition with the products of German soil in the farthest interior where heretofore they have had the market pretty much to themselves. There were also some who were opposed to almost any restriction of differential rates, declaring that on the whole the country at large profited by them, though doubtless there were individual cases of suffering.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Kankakee & Southwestern.—Extended westward 9 miles, to a point 17 miles from Otto Junction, Ill.

St. Joseph & Des Moines.—Extended northwest to Union, Mo., 13 miles, It is of 3-ft. gauge.

This is a total of 22 miles of new railroad, making 1,267 miles completed in the United States in 1878, against 1,396 miles reported for the corresponding period in 1877, 1,677 in 1876, 804 in 1875, 1,101 in 1874, 2,778 in 1873, and 4,970 in 1872.

WATER RATES are somewhat lower, though the change is chiefly in lake rates, which began Wednesday of last week quoted "weak" at 4¼ cents per bushel for wheat, and 4 for corn from Chicago to Buffalo, but by Saturday seemed to be generally a quarter of a cent lower, and on Tuesday of this week are about 3¾ and 3½—which is accounted for by the decreasing shipments, and especially by the decreasing receipts at the Northwestern markets. The receipts at Chicago and Milwaukee usually measure the demand for vessels, but this year, heretofore, Detroit and Toledo have shipped an unusually large amount, the former almost entirely of winter wheat, which is, or can be, marketed earlier than other grains, and the latter of winter wheat and corn. The pressure on the carriers at the leading lake ports will be seen very well by the following statement of weekly receipts at Chicago and Milwaukee since July:

	Chicago.	Milwaukee.	Both.
August 5	2,690,896	243,200	2,943,096
" 12	3,712,287	125,000	3,837,287
" 19	4,799,073	274,000	5,073,073
" 26	4,795,692	452,674	5,218,366
Sept. 2	4,797,383	466,300	5,263,683
" 9	4,355,911	501,500	4,857,411
" 16	3,376,657	555,025	3,931,682
" 23	3,068,297	614,600	3,682,897
" 30	2,728,922	719,000	3,447,922

Here we see that there has been an increase followed by a decrease in the receipts of the Lake Michigan ports (which give most occupation to the lake vessels by reason of the long voyage, not to speak of the larger amount of shipments), and that the movement culminated the last week in August, decreasing steadily since, until in the last week in September the receipts were a third smaller than in the last week in August. It is true that the shipments have not fallen off in the same proportion as yet, but it is the pressure of freight offered that forms the demand for transportation, and when declining receipts show that there is not likely to be difficulty in getting the grain off before navigation closes, there is less eagerness to ship and less willingness to pay full prices.

But it appears from the above that while receipts have been decreasing rapidly at Chicago, where the business is chiefly in corn, winter wheat and oats, they have been increasing at Milwaukee, where spring wheat and barley make up almost the entire grain business. In this the ordinary course of Milwaukee receipts has been followed. The spring wheat of Minnesota and Wisconsin does not usually begin to come forward freely until after the middle of September. The Milwaukee business, however, is, and is likely to remain this year, a small proportion of the whole, and the indications are that the grain movement of this season has passed its culmination, and will be more moderate hereafter, though very likely still such as in any other year would be called very great.

In canal rates the only change seems to be in the rates on corn and oats, which are reported at 7 and 5 cents a bushel from Buffalo to New York, while they were a quarter of a cent higher last week. Wheat remains at 8 cents, and no change in rail rates is reported. The decrease in receipts in the Northwest is not felt for some time by the canal, which is still carrying very large amounts of grain.

Ocean freights remained nearly stationary until Tuesday last, when 6d. to 6¼d. by steam to Liverpool were quotations, instead of 5½d., which had ruled for a week or more previous. By sail there seems to be little or no change, one charter to Cork for orders being reported Tuesday at 5s. 9d. Other steam rates to Liverpool Tuesday were $\frac{5}{16}$d. to $\frac{1}{2}$d. per pound for cotton (higher than usual), 40s. per ton for cheese, 4s. per barrel for apples, 30s. per ton for bacon, and to London 2s. 9d. per barrel for flour.

Ocean rates still continue low, but, in proportion to distance, about the same as lake rates. A bushel of wheat now is carried from Chicago to Liverpool by water for about 24 cents, aside from transfer charges. Meanwhile red winter wheat is quoted at 89½ cents per bushel in Chicago and at $1.27 in Liverpool.

THE PROPOSED EAST-BOUND FREIGHT APPORTIONMENT has not yet made a great deal of progress, but as much perhaps as was to be expected. It was not thought necessary to complete the combination and get it fully into working order much before the close of navigation, which is still nearly two months distant. Traffic in the fall is so heavy when crops have been good that usually paying rates are maintained simply by the demand for cars. But the meeting at which an apportionment was proposed recommended that the companies, at the several points where traffic is to be divided, should themselves agree upon a division if possible, and report to a general meeting to be held by the first of this month, where the details of the combination and the manner of carrying out its objects should be determined. But, of course, the divisions are just the difficulties, and it is not surprising to hear that at only one of the points—St. Louis—has an agreement as yet been effected. This latter, it is reported, is simply a repetition of the division made last spring (which, by the way was carried out), giving equal shares of the east-bound freight to each of the roads—the Chicago & Alton, the Toledo, Wabash & Western, the Indianapolis & St. Louis, the Vandalia Line, and the Ohio & Mississippi.

Owing to the failure of the railroads to agree upon divisions, it has been thought best not to call the general meeting yet. But it was always intended, we believe, to fix the divisions by arbitration in case the companies interested could not agree—which was hardly to be expected in all cases—so that the delay is probably rather to give those who have not yet made a serious beginning of negotiations an opportunity to agree if they can. Meanwhile the decrease of grain shipments may so lessen the pressure on the companies as to make it difficult to maintain paying rates even before navigation closes. Already, it is said, concessions are made, and these will not have to go very far before leaving the business wholly without profit. At best it is going to be very hard—probably impossible—to make the through traffic as profitable this fall as last. There may be more carried—probably will be—but last year 35 cents per 100 lbs. was had from Sept. 1 to Oct. 14, and 40 cents afterward; while this year the regular rate has never exceeded 30 cents, and this probably has not always been maintained and at present there seems to be no prospect that any advance can be made before the close of navigation, as the traffic tends to decrease, and both lake and canal rates are slightly weaker rather than stronger. A thirty-cent rate, however, will not be bad this fall, provided it is strictly maintained, and if rates are maintained in the winter as well as the fall, the results of both together will doubtless compare very favorably with last year.

NEW YORK GRAIN RECEIPTS IN SEPTEMBER were 16,037,777 bushels this year against 11,075,684 last, the increase over the very large business of 1877 being thus nearly 50 per cent. This year 38 per cent. of the whole, or more than 6,000,000 bushels, was brought by the railroads; last year 3,667,000 bushels, which, however, was 33 per cent. of the total receipts last year. Compared with last year the railroads have increased their business 65 per cent.; the canal, 32 per cent. Canal rates for the month have been nearly the same as last year, but rail rates have been somewhat lower. Of the total rail receipts, 6,047,780 bushels, the New York Central & Hudson River brought 3,092,227 bushels (51.2 per cent.), the New York, Lake Erie & Western 1,997,282 (33 per cent.), and the Pennsylvania 945,753 (15.6 per cent.), the small remainder coming by "other roads." Last year in September the percentages were: New York Central, 51.3; Erie, 35.9; Pennsylvania, 12.8. The change seems to have been a gain to the Pennsylvania at the expense of the Erie, which, however, has seldom delivered more grain in a month than last month. The total rail receipts, however, were a third less in September than in August, while the canal receipts were a third more. That is, rail and water receipts for the two months were:

	Rail.	Water.	Total.
August	9,687,521	5,534,377	15,221,898
September	6,047,780	9,989,997	16,037,777

Thus, without any important change in the aggregate receipts, the railroads and the canal seem to have changed places. The former brought 63.7 per cent. of the total in August, and but 37.7 in September. A change in rates may partly account for it. August receipts were partly of through rail shipments at very low rates, and through shipments in September have been considerably smaller. But, on the other hand, canal rates were much higher in September than in August, and although rail rates from Buffalo were also higher, still the difference in favor of the canal seems to have been greater in August, when it got but a third of the grain, than in September, when it got two-thirds of it.

Still, except in August last, the deliveries of grain by rail in New York were larger last September than ever before; and there was probably some profit in the business, which has not been the case most of the time this year.

AUGUST EARNINGS are reported this week for eight roads besides the 24 given in our table last week, and six of the eight show an increase in earnings. The Central Pacific, whose report was not withheld but only a little delayed, shows the effect of the immense California wheat crop in an increase of more than 25 per cent. in its earnings for the month, which are greater even (but from a greater mileage) than in 1876. Two Minnesota roads show large increases, in spite of the poorer wheat crop, but their August traffic must have been chiefly from the crop of 1877, and returns for future months may show decreases, though these roads are among those most affected by the recent immigration and increased area cultivated. The same may be said of the Dakota Southern, though we believe the damage to wheat was not very great so far west. The Philadelphia & Reading reflects the condition of the coal business in a very small decrease; the Mobile & Ohio has a considerable decrease, which on other cotton roads would be accounted for by the stagnation caused by yellow fever; but as the country on the line of this road has been almost entirely free from the epidemic, and Mobile would seem to be the natural resort in these times of a considerable country that ordinarily trades at Memphis and New Orleans, the decrease in this case seems not to be so explained. Small increases are shown by the Union Pacific and the Intercolonial.

The eight roads for which we have reports this week have had little or no increase of mileage since last year. In the aggregate their earnings increased from $4,143,479 in August, 1877, to $4,597,204 in 1878, or 3¾ per cent., which is substantially the same as that of the 24 roads in last week's table; but those showed no increase per mile of road as do those reporting this week.

THE PULLMAN PALACE CAR COMPANY seems to be making progress in reducing its funded debt, which, in a company of this kind, is desirable, though its debt is already a small proportion of its total capital. It now gives notice that the $603,000 of five-year 7 per cent. debenture bonds which fall due Oct. 15 will be paid on presentation on or before that date, and that it will exchange for part of them at 2½ per cent. discount, or will sell at par, a new issue of $400,000 ten-year 7 per cent. debenture bonds. Holders of the maturing bonds who wish to exchange for the new bonds should make application before Oct. 10, until which time the issue will be reserved for them. By this operation the company's debt will be reduced $203,000, leaving it $2,164,000, while the share capital is $5,938,200, and the assets as they are charged upon the books amount to more than $12,000,000. The funded debt, therefore, appears to be only 18 per cent. of the cost of the property by which it is secured.

ENGLISH PRICES OF WHEAT are reported to be (for home grown) just about one-fourth less this year than last year at the same time, and the lowest for ten years. Cheap bread is counted there one of the chief conditions necessary to prosperity in general industry, and we supply that country not only with cheap bread, but cheap meat—the cheapest bacon for many, many years. So far it does not seem to reflect the influence of this reduction in the cost of the chief elements of the workman's living—at least not in the shape of a revival of industry. It has, however, doubtless made possible the great reductions in wages there, and perhaps is preparing the way for a "good time coming" which will probably reach us before it does Europe.

PORTUGAL at the end of 1877, according to the Spanish *Railroad Gazette* (*Gaceta de los Caminos de Hierro*) had 602 miles of railroad completed in sixteen different lines, the longest of which was 172 miles (from Lisbon to the Spanish border). Considering the limited extent of roads in operation, it had a large amount under construction—seven lines in all, 177 miles long; while the lines projected measure 870 miles.

During 1877 the roads in operation earned an average of $12,400—which certainly ought to encourage the building of more roads.

THE AMERICAN INSTITUTE OF MINING ENGINEERS will hold its next meeting in Northern New York, beginning at Ticonderoga, Tuesday noon, Oct. 15, where there will be visits to the graphite and iron works, the fort and the falls. Wednesday there will be a sail around Lake George, and in the evening a session at Port Henry. Thursday the mines and furnaces at Moriah and Port Henry will be visited, and Friday there will be an excursion to Au Sable chasm and the horseshoe nail works at Keeseville.

LIGHT TRAFFIC is not confined to American railroads or lines in new countries alone. In France there is a class of roads called "railroads of local interest" (mostly quite short ones) which at the end of last year measured in the aggregate 1,476 miles. Their average gross earnings per mile that year were $2,080 and their working expenses $1,788. Considering that their average cost had been $44,500 per mile, the net earnings of $292 per mile can hardly be said to have been satisfactory.

ATLANTIC GRAIN EXPORTS for the eight weeks ending Sept. 26 were 40,693,050 bushels, against 19,630,486 bushels for the corresponding week last year, being an increase of 107½ per cent. And yet last year the exports, especially of wheat, were unusually early and unusually heavy. The wheat exports this year have been more than three times as great as last year.

NEW YORK WHEAT EXPORTS for the crop-year ending with August last were 46,305,410 bushels, which was 281 per cent. more than the exports of the previous year and 64 per cent. more than in the year 1875-76. Last year about 70 per cent. of the whole went to Great Britain, 18¾ per cent. to France, and 10 per cent. to Germany.

THE ITALIAN RAILROADS, in the first half of 1878, earned an average of $2,760 per mile, or at the rate of $5,520 per year, which is some 10 per cent. less than the average of American railroads. The total length in operation in Italy was 5,064 miles, having increased during the half-year by the completion of four short lines or extensions measuring altogether 45 miles.

Contributions.

The Cheapness of Narrow-Gauge Railroads.

BELLWOOD, Sept. 21, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

When I wrote the letter to the Osceola *Reveille* to which you refer in your issue of the 13th inst., it was written hurriedly in answer to some questions of the editor, and not with the expectation or desire to provoke a discussion in the newspapers, or I might have been more careful and explicit in the wording of the claims. I am not one of those who believe in forcing the narrow-gauge system on the advocates of the broad gauge; on the contrary am satisfied to let it stand on its merits. If it has the advantages over the broad gauge, that we claim for it, it is merely a question of time until these advantages MUST be recognized, not on account of nice theoretical reasons, but through actual results reached and proven in the operation of narrow-gauge roads. I agree with you in your remarks on ambiguous statements and "windy views" of some of the advocates of narrow gauge. But you must admit that the narrow-gauge system is comparatively a new thing, and that facts are hard to get. Narrow-gauge roads in this country have only been built in the past seven years, and only a few of them are of any length, so that theories are plentier than facts, and must be drawn on to some extent. Then there is another reason why the system has not given greater evidence than it has of the merits claimed for it by its advocates, and that is this: the prevailing idea seems to be that while broad-gauge roads must be located and built by engineers of recognized ability, and after the most approved standard of railroad construction, narrow-gauge roads can be located by any person who can build "a rail fence or lay out a private lane;" and the consequence is that a large number of the narrow-gauge roads are without ballast, no alignment, poorly constructed, and in no condition to operate. People are afraid to ride over them, and it will take all the earnings, for years, to do the work that should have been done at first, before they are in a condition to show what the narrow-gauge system really is. I hold that a narrow-gauge road requires the same engineering ability and the same standard of construction that is required on the broad gauge; and they must be constructed on these principles before they can get the confidence of the traveling public.

Now as to my claims:

1st. That a narrow gauge can be built and successfully operated where a broad gauge cannot.

2d. It can be built for from one-half to two-thirds the cost of broad gauge.

3d. It has equal capacity with the broad gauge at about two-thirds the cost of operation.

I do not mean by the first claim, that from physical or mechanical reasons it would be impossible to build a broad-gauge road where a narrow gauge can be built, because with plenty of money there are very few things impossible in the line of engineering; but there is a "financially impossible" which is really a practical "impossible," and to this I refer (or, to change the phraseology) I would claim, first, that a narrow-gauge road *can be built and successfully operated* where, owing to the cost of constructing a broad gauge, the latter would be impracticable. All opponents of the narrow gauge admit that the graduation of a narrow-gauge road bed costs less than a broad gauge. This difference in cost being more or less as the country may be hilly or rolling, the two gauges being nearer an equality on level ground; but the difference is always in favor of the narrow gauge. This difference is owing to the fact that the broad gauge requires at least two feet more in width of road bed than the narrow gauge. When the line is through hilly country (when the road is located on the side hill), the saving in the cost of construction in favor of the narrow gauge becomes very great, even if the two gauges could be located on the same line (in the case of the broad-gauge railroad it would have doubled the cost of the road to have made it two feet wider on the same location); but as great stress has been placed on lines "giving the same facilities"—and as it is a fact capable of practical demonstration, that the friction on curves on the same radius is much greater with a 4 ft. 8½ in. truck on a 4 ft. 8½ in. gauge than the friction of a 36 in. truck on a 36 in. gauge. We must take curves for each gauge upon which the friction will be equal, and I find this to be as 10 to 16; that is, a 10° curve on a broad gauge will produce the same amount of friction as a 16° curve will on the narrow gauge. Now it is evident that in rounding spurs and ravines the narrow gauge can fall on a contour line much better than a broad gauge (still giving "the same facilities"), and any engineer knows that on heavy hill-sides the variation of a few feet from the contours will add immensely to the cost. There are three points on the line of this road where to have located 18° curves instead of 27½° curves (equalizing the friction), would in a distance of 1,000 ft. have cost over $25,000 extra (or the whole cost of the $8\frac{1}{10}$ miles). Now to locate a line for a broad gauge, keeping the same proportion in curves, would have more than quadrupled the cost of grading the Bell's Gap Railroad; indeed, a survey was made through the gap by an engineer (a few years before I located the Bell's Gap Railroad), who surveyed and estimated for a broad-gauge road, and he put the cost at $25,000 per mile—about ten and a half times the actual cost per mile of the Bell's Gap Railroad, ballast and cross-ties.

It does not require any figuring to prove to a practical person that it will cost much more to furnish cross-ties and ballast for a gauge 4 ft. 8½ in. wide than it does for a gauge 3 ft. wide. I will give the result, based on *actual* prices, of the difference in cross-ties and the difference in amount of ballast.

BALLAST.

Broad gauge	2,750 cubic yards per mile.
Narrow gauge	1,850 " " "

(Depth of sub-ballast being same, 12 in.) Here we have 900 yards at 50 cents per yard, equal to $450. Narrow-gauge ties cost 25 cents, broad gauge, 45 cents; saving, 20 cents per tie, or $528 per mile; total saving in ballast and cross ties, NINE HUNDRED AND SEVENTY EIGHT DOLLARS PER MILE.

IRON RAILS.

The points that I have already shown (with perhaps the exception of the claim in regard to the ratio of the friction on curves) are generally admitted, as they are so self-evident, the difference being solely owing to the difference in width of track: I know that our claim regarding the difference in weight of iron required for the respective gauges is disputed, and that some advocates of broad gauge claim that just as light rails can be used on the broad gauge as on the narrow gauge. I think I can give some good reasons at least, if I do not convince, for the claims made by advocates of the narrow gauge.

We claim (for reasons that I shall give hereafter) that with a 35 to 40-lb. rail we are as fully able to transport as many tons of paying freight during the life of the rail as can be done on the broad gauge during the life of a 56-lb. rail, or even a heavier rail (and very few broad-gauge roads use so light a rail). Such being the case, and taking a 35 and 56-lb. rail as a basis (spikes, fish-plates and bolts being properly proportioned), and collecting our previous figures on road-beds, etc., we arrive at the following table—not taking into consideration the cost of engineering, fences, etc., as they are the same in both cases:

Cost per Mile of Bell's Gap Railroad.

	Narrow gauge.	Broad gauge.
Graduation and masonry	$2,200	$6,800
Ballast	925	1,375
Cross-ties, 2,640	660	1,188
Iron rails { Broad gauge, 88 tons @ $35 / Narrow gauge, 55 tons @ $35 }	1,925	3,080
Spikes, splices and bolts	350	475
Track-laying	250	400
Total	$6,310	$13,318

In the above figures the cost of the Bell's Gap Railroad has been reduced to correspond with the prices and wages of the present, and shows most conclusively that my claim of a saving of one-half or two-thirds was not overdrawn; even placing the cost of graduation at what it would be for making the road-bed of the Bell's Gap 2 ft. 6 in. wider than it is (and as the natural slope of the mountain side will average 30 degrees it will give us an average of 62 cubic feet per foot of line instead of 33 cubic feet, a larger proportion of the increase being rock than of the first 33 cubic feet), throwing to one side the advantage of courses, we would still have narrow gauge $6,300 per mile to about $10,500 per mile for broad gauge (not including engineering, incidentals, etc.)

As the first claim and second claim must stand or fall together, proof of the first being proof of the second, and *vice versâ*, I will in my next take up the third claim, and give my reasons for claiming an economy of operation over broad gauge, and also show why we claim that a 36-lb. rail on the narrow gauge is equivalent to a 56 or 60-lb. rail on broad gauge.

Time alone can definitely settle the question of gauges. I may be wrong, but I believe I am right, and the more I have to do with narrow-guage roads the more I am convinced that my views are correct.

JOS. RAMSEY, JR.,
Superintendent Bell's Gap Railroad.

Proposition to Adopt a Uniform Freight Car.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Although there has been from time to time in the conventions of Master Car-Builders very much said about uniformity in certain parts of freight cars, and so far as they are concerned it is what they desire, still the diversity increases instead of diminishing. Yet who knows better than the master car-builders the inconvenience it is and the large amount of stock to be kept on hand to maintain cars of such various styles of build as are owned by nearly all the railway companies in this country? Not the railway companies alone will be benefited by a greater uniformity in the principal parts of freight cars, but the car-builders also, now that the principal railways in the North are of uniform gauge (and who can estimate the saving to railway companies if the same could have been said fifteen years ago?)

When once commenced it was not a long nor a costly job to make them so; and with these facts in my mind I venture this recommendation: What is there now to hinder a greater uniformity in the principal parts of freight cars? The exalted opinion that each master car-builder has of his skill in the construction of cars will, as I believe, forever preclude the possibility of uniformity. I recommend that all railway companies who wish to unite in this movement (principal lines especially) do, through their General Manager or General Superintendent, order one box freight car built embodying the improvements which in their judgment are good; the cars to be built, not with a view of obtaining a prize on account of the fineness of the finish or the excellency of the workmanship, but for simplicity, durability and adaptation to the service; the weight to be plainly marked on the sides of the car, carrying capacity, etc.; the cars to be delivered at some central point by Nov. 14, 1878, and the 15th of the same month the general superintendents to meet, make a careful inspection of the cars, then appoint six or more of their number as a committee to recommend what the standard freight car shall be; the dimensions, the roof, or any peculiarities, not to be interfered with, but the draw-bars and attachments, the center pins, the box, brass, axles, all the castings of the trucks and the brakes should be uniform; the railway companies represented by car or otherwise will consider themselves obligated to conform to what that committee may recommend.

Will the editor of the *Railroad Gazette* be kind enough to give this article two insertions, and act as chairman of the committee to receive replies, etc. JOHN KIRBY.

[We will receive any replies to Mr. Kirby's communication, and think the plan is a very good one. Anything which would bring about uniformity in the construction of cars would be attended with such great advantages that an effort in that direction which promises to be successful is worth a trial.—EDITOR RAILROAD GAZETTE.]

James McHenry and the Origin of the Atlantic & Great Western Railroad.

So much has been said recently of the responsibility for the statements made as to the probable success of the Atlantic & Great Western Railroad at the time its bonds were first offered in England, that the following letter from Mr. James McHenry himself, written under date of Aug. 31 last and published in the London *World*, will be read with interest:

"Quibbling" is always "unsuccessful;" and in the matter referred to in your paper of the 28th inst. it is simply idiotic. I am responsible for each and every prospectus issued on behalf of the Atlantic & Great Western Railroad Company, and every statement made by me has been justified by the reports of Sir Morton Peto, Mr. J. S. Forbes, Mr. John Young, Mr. Satterthwaite, and other gentlmen, after personal investigation into the construction of the railway, its traffic and its resources.

In railway history no concern has been more continuously watched and criticised, more resolutely pushed through to completion, more flatteringly spoken of, or more wantonly maligned than the Atlantic & Great Western. Undertaken under brilliant auspices, supported by the leading statesmen and bankers of America, carefully guarded by its most renowned lawyers, and recommended by the President, his Cabinet, and his most important foreign ministers; traversing three great states comprising one-fourth of the whole population of the United States, passing through several hundred miles of highly cultivated lands, controlling unsurpassed mineral traffic, and connecting the main avenues of travel and business between St. Louis, Cincinnati, Chicago and New York—no railway combines more elements of success, or has ever been constructed with higher assurances of safe and satisfactory investment. Petroleum alone contributes a revenue of £3,000,000 sterling annually to the railways connected with the Atlantic & Great Western district, the competition for which has led to the fierce antagonism to a property owned entirely in Europe.

That the working of the Atlantic & Great Western Railroad has disappointed just expectations does not impugn the sincerity of my statements. With such resources as it possesses and controls wisely developed and faithfully administered, there should be no difficulty in the company's honoring its obligations; and why should not every one connected with the issue of these obligations stand manfully by the company to secure the realization of just expectations, rather than, by "quibbling" or otherwise, seek to escape from responsibility involved in a prospectus or other documents? The chief, if not the only, causes of our disappointment so far have been our dependence on the Erie and its atrocious repudiation of a long succession of engagements, baffling all efforts for a proper development of our resources and collection of our earnings.

In a country of unparalleled wealth, dazzling the world with the colossal proportions of its productions and the ingenuity of its people, it is surely possible to secure for its railways the same progressive increase of business and prosperity which in Europe appear to be the natural sequence of railway construction; while simulated insolvency and daring repudiation have become epidemic in America, and have already "wiped out" half the capital invested in their railways, and made the whole insecure.

A commission of inquiry into the appropriation of the capital raised for American railways generally, and the disposition of their revenues, would bring out richer results than have followed the uncompromising pressure for the discovery of the capital and revenues intrusted to the Government of Egypt. Such a commission energetically and intelligently worked would find ample revenues to supersede the necessity for schemes of re-organization, which never, in one single instance, have been successful in reëstablishing the position of an embarrassed company. Railways have Khédives and Pashas ignorant of the difference between *meum* and *tuum*, and with Egyptian notions about appropriation of capital and ownership of revenues.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:

United New Jersey (leased to Pennsylvania), 2½ per cent., quarterly, payable Oct. 10.

Housatonic, 2 per cent., quarterly, on the preferred stock, payable Oct. 15.

Sioux City & Pacific, 3½ per cent., semi-annual, on the preferred stock, payable Oct. 1.

Vermont & Massachusetts (leased to Fitchburg), 3 per cent., semi-annual, payable Oct. 7.

Foreclosure Sales.

The *Montclair & Greenwood Lake* road was offered at foreclosure sale in Jersey City, N. J., Sept. 28. Two parties

appeared to bid—Messrs. Hewitt and Dumont, of the bondholders' committee, and A. W. Benson, a large holder of bonds, who has declined to accede to the plan of re-organization. The bidding was commenced at $50,000, and ran up gradually to $156,000, when the sale was adjourned until Oct. 5, at the request of the trustees, and in accordance with the conditions of sale. At the adjourned sale the bidding must begin at the point where it stood at the time of adjournment.

The sale of the *New York, West Shore & Chicago* road has been postponed from Sept. 27 to Oct. 28, in order to give bondholders a further opportunity to join in the purchase of the property.

The sale of the *Indianapolis, Bloomington & Western* road has been postponed from Oct. 1 to Oct. 30, by order of the Court.

Railroad Conventions.

The *Railroad Conductors' Association of the United States and Canada* will hold its twelfth annual convention at the Windsor Hotel, Montreal, Canada, beginning on Wednesday, Oct. 9.

The *General Time Convention* will hold its fall session at the Grand Pacific Hotel, Chicago, Oct. 10.

The *Railroad Claim Agents' Association* will meet at the Planters' Hotel, St. Louis, Oct. 15.

The *Southern Time Convention* will hold its fall session at the Windsor Hotel, New York City, Oct. 17.

The annual convention of the *Brotherhood of Locomotive Engineers* will be held in Indianapolis, beginning Oct. 16.

The *Narrow-Gauge Convention* will meet, pursuant to adjournment, in Cincinnati, Oct. 23.

Southwestern Railway Association.

At the regular monthly meeting in Chicago, Sept. 25, it was resolved that the local rates to the Missouri River points shall be charged as arbitraries on all business from Eastern points, except seaboard business.

In answer to a communication from the Michigan Salt Association, it was agreed to maintain uniform rates on salt.

A request from the Union Pacific, that the Association should agree to pro-rate in a lower rate on Colorado wheat was refused, as it was thought that the present concession on rates was all that the roads represented could afford.

Narrow-Gauge Convention.

In pursuance of the adjournment made by the convention held in Cincinnati July 17 and 18, the National Narrow-Gauge Convention will meet in Cincinnati, O., Oct. 23. The headquarters of the convention will be in the Burnet House, where delegates will receive tickets, etc. The call includes delegates from all narrow-gauge railways completed, partially constructed or projected; narrow-gauge construction companies and contractors; all locomotive and car builders, manufacturers of railway supplies, rail mills, railway journals, commercial and municipal bodies. Delegates from completed roads are requested to come prepared to make full reports of the cost of construction of their roads and of the operating expenses.

At the July convention several committees were appointed which will report at the adjourned meeting. These committees are follows:

Central Executive Committee.—Chairman, E. Hulbert, Bedford, Ind.

Committee on Rolling Stock and Machinery.—Chairman, E. Hulbert, Bedford, Ind.

Committee on Construction.—Chairman, S. Woodward, Cincinnati, O.

Committee on Operating Expenses.—Chairman, A. W. Wright, Rantoul, Ill.

Committee on Transfer.—Chairman, Thomas A. Mellon, Pittsburgh, Pa.

ELECTIONS AND APPOINTMENTS.

Ashtabula & Pittsburgh.—At a meeting held in Youngstown, O., Sept. 25, the purchasers of the Ashtabula, Youngstown & Pittsburgh road organized this new company by electing the following directors: Warren Packard, Henry Hubbard, H. L. Morrison, A. C. Fisk, J. J. Brooks, C. B. Wick, F. Harrington, George B. Roberts, W. S. Bissell, W. Thaw, W. P. Shinn, Thomas D. Messler, William Mullins. The board elected officers asfollows: President, Warren Packard, Warren, O.; Secretary and Treasurer, Henry Hubbard, Ashtabula, O.

Atlantic & Great Western.—Mr. H. M. Grout has been appointed Paymaster, in place of W. G. Sergeant, resigned, the change dating from Oct. 1.

Chicago & Alton.—Mr. W. C. Van Horne has been appointed General Superintendent, in place of Mr. J. C. Mullin, lately promoted to be General Manager. Mr. Van Horne was at one time on the Chicago & Alton as Assistant Superintendent, was afterwards General Superintendent of the St. Louis, Kansas City & Northern, and for five years past has been General Manager of the Southern Minnesota. He was recently chosen President of that company.

Chicago, Rock Island & Pacific.—A circular from this company announces the appointment of Frank K. Hain Division Superintendent and John Givin Division Freight Agent of the Keokuk & Des Moines Division, with offices at Keokuk, Ia. Both have held the same position on the road for some time.

Cincinnati Southern.—Mr. Samuel Woodward has been appointed Superintendent of Transportation, and Edward P. Wilson General Passenger Agent. Mr. Woodward was formerly Superintendent of the Indianapolis & St. Louis, and is now President of the Cincinnati & Eastern.

Columbus, Washington & Cincinnati.—Mr. John W. Merchant has been chosen President, in place of James F. Ely, resigned.

Corpus Christi, San Diego & Rio Grande.—Mr. F. L. Whipple has been appointed Master Mechanic, and has his office at Corpus Christi, Texas.

Fitchburg.—Until further orders, Mr. John Adams, Assistant Superintendent, will act as Superintendent, in place of Mr. C. L. Heywood, resigned.

Grand Haven.—The officers of this company, successor to the Michigan Lake Shore, are: J. W. Converse, President; J. H. Wade, Vice-President; Fred. H. May, Manager. The office of the Manager is at Allegan, Mich.

Indianapolis, Peru & Chicago.—The following circular is dated Sept. 23:

"On and after the first day of October, 1878, the General Passenger and Ticket Department of this company will be divided; all matters pertaining to the general ticket office will be transferred to the Auditor's office. All communications relative to rates, divisions, etc., should be addressed to Chas. H. Rockwell, Auditor and General Ticket Agent. The Passenger Department will be under the control of Mr. F. P. Wade, as General Passenger Agent."

Lawrenceville Branch.—Col. Tyler M. Peeples has been chosen President. His office is at Lawrenceville, Gwinnett County, Georgia.

Master Car Painters' Association.—The following officers were chosen at the recent annual convention in Cleveland: President, D. D. Robertson, Michigan Central, Detroit, Mich.; Vice-President, J. H. Will, New York Central & Hudson River, Harlem Division, Morrisania, N. Y.; Secretary and Treasurer, R. McKeon, Atlantic & Great Western, Kent, O.

Missouri, Kansas & Texas.—Mr. L. F. Sheldon, having resigned the superintendency of the Cherokee and Neosho divisions, will, in addition to his duties as Superintendent of Telegraph, perform the duties of Paymaster until further orders.

Missouri River, Fort Scott & Gulf.—Mr. C. J. Smith has been appointed Acting Auditor, and J. H. Aldrich, Acting Cashier, in place of C. H. Prescott, Auditor and Cashier, who resigned Oct. 1.

Nashville, Chattanooga & St. Louis.—At the annual meeting in Nashville, Tenn., Sept. 11, the following directors were reëlected: E. W. Cole, T. D. Fite, J. A. Satterthwaite, B. F. Wilson, G. M. Fogg, N. C. Collier, Nashville, Tenn.; E. L. Jordan, J. W. Childress, Murfreesboro, Tenn.; Thomas C. Whiteside, Thomas Lipscomb, Shelbyville, Tenn.; W. S. Huggins, Manchester, Tenn.; John P. King, Augusta, Ga.; W. T. Walters, Baltimore; Vernon K. Stevenson, A. Iselin, Jr., New York. The board reëlected E. W. Cole President; R. C. Bransford, Secretary and Treasurer; J. W. Thomas, General Superintendent; R. C. Morris, Resident Engineer.

PERSONAL.

—Mr. George W. Barker, Superintendent of the New York Division of the Pennsylvania Railroad, died at his residence in Jersey City, Sept. 26, in the 50th year of his age. While yet almost a boy he served as a brakemen on an Eastern road, and afterward for some years as brakeman and conductor on the Camden & Amboy. Subsequently he went to the Erie, serving several years as conductor and ticket agent. In 1862 he became a conductor on the New Jersey Railroad and the following year was made Depot Master at Jersey City, from which position he was promoted in 1867 to be Master of Transportation. When the New Jersey roads were leased to the Pennsylvania he was made Superintendent of the New York Division, the main line from New York to Philadelphia. Mr. Barker was a very active, careful and reliable officer; mainly self-taught, he made his way up by merit and perseverance alone, and entirely without aid from outside influence. A thorough disciplinarian, he yet knew his subordinates well, always listened to their complaints and was both liked and respected by them. It is said of him that he knew every man on his division by name and could always recall some circumstances relating to their condition or family. It was undoubtedly due mainly to his personal influence that there was no strike on this important division last year, or, indeed, on any of the company's New Jersey lines, of which he was at that time Acting General Superintendent, in the absence of Mr. Jackson. And his popularity was not due to any laxity or favoritism, for he was well known as a strict, though just, master. Mr. Barker had been in failing health for several months, but had been only a short time absent from his post.

—Mr. W. A. Merrill, Paymaster of the Missouri, Kansas & Texas road, has been missing from his home in Sedalia, Mo., since Sept. 21. He had been in poor health for some time, and it is feared that he has committed suicide or wandered off, while slightly out of his mind.

—Edward H. Goff, of Montreal, formerly President of the Montreal, Portland & Boston Company, has absconded, the Grand Jury having found a true bill against him for forgery on the Canadian Agricultural Insurance Company.

—Col. W. K. Edwards, a prominent lawyer, and for many years a director of the Terre Haute & Indianapolis Company, died in Terre Haute, Ind., Sept. 26, in his 60th year. He was born in Kentucky, but settled in Terre Haute in 1838. He was for many years the confidential business man of the late Chauncey Rose, and has managed his estate as executor since his death.

—Mr. C. H. Prescott, Auditor and Cashier of the Missouri River, Fort Scott & Gulf road, has resigned his position and has accepted that of Cashier in the banking house of Armour Brothers in Kansas City, Mo.

—The Democrats of the Fifth New Jersey District have nominated as their candidate for representative in Congress Thomas W. Demarest, one of the first projectors and for a number of years President of the Northern Railroad of New Jersey. Col. Ezra Miller, inventor of the well-known platform and coupler, was one of his chief opponents for the nomination and came very near securing it.

—Mr. John E. Becton, Master Mechanic of the Chicago St. Louis & New Orleans road, died of yellow fever at Water Valley, Miss., Sept. 30. Mr. Becton's death is said to have resulted from his great exertions in behalf of other sufferers.

TRAFFIC AND EARNINGS.

Coal Movement.

Coal tonnages for the week ending Sept. 21 are reported as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite	352,050	348,081	I. 3,969	1.1
Semi-bituminous	76,449	80,626	D. 4,177	5.2
Bituminous, Pennsylvania	35,744	43,667	D. 7,923	18.1

The result of the recent elections in Canada in favor of the party advocating a protective tariff makes it altogether probable that a duty will be imposed on coal coming from the United States, which will affect a considerable business.

Norfolk Cotton Business.

Cotton receipts at Norfolk, Va., for September, the first month of the cotton year, were as follows, in bales:

	1878.	1877.	Increase.	P. c.
At., Miss. & Ohio R. R.	6,231	2,669	3,562	133.5
Seaboard & Roanoke R. R.	5,206	2,438	2,768	113.5
Canals and otherwise	293	104	189	181.7
Total	11,730	5,211	6,519	125.4

Of the receipts this year 2,946 bales were local, consigned to Norfolk, and 8,784 bales were through, for points beyond.

Cotton Movement.

For the period from Sept. 1 to 27, inclusive, receipts of cotton at the several primary markets have been, in bales:

1878.	1877.	1876.	1875.	1874.
246,458	83,071	221,952	186,756	155,221

Thus the receipts this year, in spite of the yellow-fever epidemic, which greatly limits the business at some of the leading markets, are nearly three times as great as those of last year, and 11½ per cent. greater than in any other of the five years. Last year, however, the crop was very late and the picking season unfavorable, while this year it is probably the earliest ever known, with favorable weather for picking.

The exports for the same 27 days have been 30,441 bales this year against 17,608 last, an increase of 73 per cent.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Year ending Aug. 30:				
Ind., Cin. & Lafayette	$1,309,087	$1,311,210	D. $2,123	0.2
Expenses	814,699	820,400	D. 5,701	0.7
Net earnings	$494,388	$490,810	I. $3,578	0.7
Earnings per mile	6,818	6,847	D. 29	0.4
P. c. of expenses	62.23	62.57	D. 0.34	0.5
Mobile & Ohio	2,098,540	2,072,635	I. 25,905	1.2
Expenses	1,498,527	1,559,108	D. 60,581	3.9
Net earnings	$600,013	$513,527	I. $86,486	16.8
Earnings per mile	3,982	3,933	I. 49	1.2
Per cent. of exps.	71.41	75.22	D. 3.81	5.1
Eight months ending Aug. 31:				
	1878.	1877.		
Central Pacific	$11,106,363	$10,592,644	I. $513,719	4.8
Dakota Southern	138,088	109,023	I. 29,065	26.7
Denver & Rio Gr'de	679,845	464,985	I. 214,860	46.2
Net earnings	280,796	226,018	I. 54,778	24.3
Kansas Pacific	2,160,097	1,930,232	I. 229,865	11.9
Net earnings	764,602	756,905	I. 7,697	1.0
Mobile & Ohio	1,147,089	1,049,495	I. 97,594	9.3
Philadel'a & Reading	8,060,939	8,904,013	D. 843,074	9.5
St. Louis & Southeastern	741,986	689,668	I. 52,318	7.6
Net earnings	154,809	128,355	I. 26,454	20.6
St. Paul & Sioux City	378,297	287,506	I. 90,791	31.6
Sioux City & St. Paul	235,730	158,598	I. 77,132	48.6
Union Pacific	7,840,038	8,065,540	D. 225,502	2.8
Seven months ending July 31:				
Grand Rapids & Indiana	$669,687	$598,660	I. 71,027	11.9
Net earnings	70,799	175,418	D. 95,619	54.5
Month of August:				
Central Pacific	$1,706,000	$1,362,072	I. 343,928	25.2
Cincinnati Southern	52,328	.....	.....	....
Net earnings	36,722	.....	.....	....
Dakota Southern	15,164	12,537	I. 2,627	21.0
Intercolonial	121,129	119,446	I. 1,583	1.3
Mobile & Ohio	114,979	125,714	D. 10,735	8.5
Philadelph'a & Reading	1,402,792	1,420,879	D. 18,087	1.3
St. Paul & Sioux City	45,464	39,169	I. 6,295	16.1
Sioux City & St. Paul	28,446	24,022	I. 4,424	18.4
Union Pacific	1,075,230	1,039,540	I. 35,690	3.4
Third week in September:				
Chi. & Eastern Ill.	$21,701	$17,138	I. 4,563	26.7
Chicago, Mil. & St. Paul	156,000	286,558	D. 130,558	45.6
Denver & Rio Gr'de.	26,350	19,483	I. 6,867	35.2
St. Louis, Iron Mt. & Southern	124,300	118,611	I. 5,689	4.8
Week ending Sept. 20:				
Gt. Western, of Can.	$85,061	$99,364	D. $14,303	14.4
Week ending Sept. 21:				
Grand Trunk	$186,824	$214,217	D. $27,393	12.8

Grain Movement.

Week ending Sept. 14.—For the week ending Sept. 14, receipts of grain of all kinds at the eight leading Northwestern markets have been, in bushels, for six years:

1878.	1877.	1876.	1875.	1874.	1873.
6,397,260	5,751,856	3,512,610	3,878,940	3,800,277	6,128,249

This year the receipts were 11¼ per cent. greater than the very large receipts of the corresponding week of last year, but not quite 5 per cent. greater than those of the corresponding week of 1873. They are much smaller, however, than the receipts of the four weeks previous this year.

For the same week the shipments of these same markets have been:

1878.	1877.	1876.	1875.	1874.	1873.
5,813,414	4,893,113	4,657,952	3,853,150	3,075,032	6,082,202

The shipments this year are 20 per cent. greater than last for the corresponding week, but a little less than in 1873. They are smaller, however, than for either of the two preceding weeks.

The quantities and percentages of the above shipments which went forward by rail were as follows:

1878.	1877.	1876.	1875.	1874.	1873.
1,022,581	1,024,304	1,088,318	1,564,052	257,523	1,266,456
17.6 p.c.	20.9 p. c.	36.3 p. c.	40.6 p. c.	8.5 p. c.	20.8 p. c.

Though the rail shipments were about the same as for the corresponding week last year, they were the smallest this year for nine weeks, and this in spite of higher water (canal, not lake) rates.

For the same week the receipts of the seven Atlantic ports have been:

1878.	1877.	1876.	1875.	1874.	1873.
8,249,026	4,927,774	3,607,278	3,442,577	2,776,801	3,811,293

Not only are these receipts vastly greater than those for any corresponding week of previous years, but they are more than a million bushels greater than those of any previous week this year, and much the largest ever received in any one week. The fact that the Atlantic receipts are largest when Northwestern receipts and shipments have fallen off is accounted for by the time occupied in transit, which is from one to three weeks.

Of the Atlantic receipts this year 59.5 per cent. arrived at New York, 14 at Baltimore, 11 at Philadelphia, 9.4 at Montreal, 5.8 at Boston, 0.1 at Portland and 0.1 per cent. at New Orleans. The New York receipts are the largest ever known in a single week and are an unusually large proportion of the whole.

Week ending Sept. 21.—Receipts of grain of all kinds at the eight leading Northwestern markets for the week ending Sept. 21 have been, for the past six years:

1878.	1877.	1876.	1875.	1874.	1873.
5,851,401	6,655,480	4,360,091	3,512,700	4,206,222	5,303,884

The receipts of the week were 12 per cent. *less* this year than last—the first week for a long time that this has been the case, and partly due to the fact that receipts last year were exceptionally large, and partly to the fact that this year they were smaller than they have been before since July—35 per cent. less than the receipts of the week ending Aug. 24, which were the largest ever known. The receipts this year are still large, however.

The shipments of these same markets for the same week have been:

1878.	1877.	1876.	1875.	1874.	1873.
4,852,847	5,040,528	4,089,315	3,684,452	2,563,893	5,262,374

The shipments this year are also the smallest since July, and nearly a million bushels less than the shipments of the previous week, and are 3¾ per cent. less than the shipments for the corresponding week last year.

Of these shipments the number of bushels and the percentage of the total shipped by rail each year has been:

1878.	1877.	1876.	1875.	1874.	1873.
994,118	1,082,128	1,820,361	1,378,492	351,198	1,463,922
20.5 p. c.	21.5 p. c.	44.5 p. c.	37.5 p. c.	13.7 p. c.	27.8 p. c.

The rail shipments are less in amount and a smaller proportion of the whole than in any of the five preceding years except 1874. They are the smallest this year for ten weeks.

The receipts of the seven Atlantic ports for the same week have been:

1878.	1877.	1876.	1875.	1874.	1873.
6,195,590	4,515,750	3,234,870	3,586,717	3,638,261	3,967,286

Of the receipts of the week this year, 56.4 per cent. were at New York, 15.2 at Philadelphia, 13.6 at Baltimore, 6.9 at Montreal, 6 at Boston, 1.7 at New Orleans and 0.2 at Portland.

The receipts this year are the smallest for six weeks, but are still very large—exceeded only last year and probably never in any previous year. These Atlantic receipts, however, have not yet felt the full effect of the declining movement in the Northwest. The receipts this year for the seven weeks since July have been about equal to ten weeks' receipts last year after July, and last year the movement was extraordinary. But last year the largest receipts were after Sept. 21, which does not seem likely to be the case this year. Since July this year the average weekly receipts have been 6,700,000 bushels, the average of the seven heaviest weeks of last fall (which were included within the nine weeks after Sept. 22) was less than 5,900,000 bushels. If we may judge from the Northwestern receipts and shipments recently, the movement hereafter may not equal that at the same time last year; but that may well be without preventing the total business of this fall from equaling or exceeding last year's.

Receipts of grain at Milwaukee during the month of September were 2,503,804 bushels this year against 6,025,111 in 1877, showing a decrease of 3,521,307 bushels, or 59 per cent.

For the week ending Sept. 30 receipts and shipments at Chicago and Milwaukee were:

	Receipts.	Shipments.
Chicago	2,728,922	3,145,688
Milwaukee	719,000	289,700

The aggregate receipts are smaller and the shipments larger than for the preceding week.

For the same week receipts and shipments at Buffalo were:

	Receipts.	Shipments.
By rail	497,100	1,229,145
By water	2,068,525	3,020,958
Total	2,565,625	4,250,103

The receipts are 1,800,000 bushels less and the shipments 468,000 less than in the preceding week, but much greater than in the corresponding week of 1877. For the month of September, or rather for the four weeks ending Sept. 30, Buffalo's receipts and shipments were:

	Receipts.	P. c. of total.	Shipments.	P. c. of total.
By rail	2,352,900	14.8	5,843,580	36.1
By water	13,577,216	85.2	10,342,853	63.9
Total	15,930,116	100.0	16,186,423	101.0

For the same week the receipts at four Atlantic ports were:

New York	3,105,862	Philadelphia	731,400
Baltimore	717,655	Boston	233,325

Of the New York receipts, 939,000 bushels, or 30.3 per cent. were by rail. Its total receipts are the smallest since July, as are also Baltimore's and Philadelphia's, while Boston's are the smallest since the first week in July.

Baltimore grain receipts for September were as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Flour, barrels	154,747	121,263	I. 33,484	27.6
Wheat, bushels	3,800,364	1,187,472	I. 2,612,892	220.0
Corn	625,324	927,189	D. 301,865	32.6
Other grain	90,897	83,968	I. 6,929	8.3
Total grain	4,516,585	2,198,629	I. 2,317,956	105.4
Total, flour reduced to bushels	5,290,320	2,804,944	I. 2,485,376	88.6

For the nine months ending Sept. 30 the receipts were as follows:

	1878.	1877.	Increase.	P. c.
Flour, barrels	1,004,182	840,604	163,578	19.5
Grain, bushels	31,504,194	23,120,321	8,383,873	36.2
Total, bushels	36,525,104	27,323,341	9,201,763	33.7

Exports for September were 59,201 barrels of flour, 3,481,681 bushels wheat and 497,582 bushels corn.

The Buffalo *Commercial Advertiser* reports grain receipts at that port for September and the nine months ending Sept. 30 as follows:

Month:	1878. Flour.	1878. Grain.	1877. Flour.	1877. Grain.
By lake	95,484	14,252,937	67,238	9,011,905
By rail	83,500	2,490,500	102,300	1,446,800
Total	178,984	16,743,437	169,538	10,458,705
Season:				
By lake	591,690	56,379,308	404,095	37,620,812
By rail	532,200	22,884,400	759,600	10,348,440
Total	1,123,890	79,263,708	1,163,695	47,969,252

Rail receipts for the month were 46 per cent. of the flour and 15 perc ent. of the grain; for the season, 48 per cent. of the flour and 28 per cent. of the grain.

Shipments eastward of grain received by lake for the nine months were:

	1878.	1877.	Increase.	P. c
By canal, bushels	42,133,605	32,466,970	9,666,635	29.8
By rail	14,923,362	6,124,389	8,798,973	143.7
Total	57,056,967	38,591,359	18,465,608	47.8
Per cent. by rail	26	16	10	62.5

The canal opened April 15 in 1878, and May 8 in 1877.

Erie Canal.

The business of the canal at Buffalo from the opening up to Sept. 30 was as follows:

	1878.	1877.	Increase.	P. c.
Boats cleared	6,490	4,570	1,920	42.0
Tolls received	$453,158	$309,027	$144,131	46.6

The canal opened April 15 in 1878, and May 8 in 1877, making 169 days this year, against 146 last year.

THE SCRAP HEAP.

Railroad Manufactures.

The Wason Manufacturing Co., at Brightwood, Mass., last week shipped seven passenger cars and two combination (baggage, mail and smoking) cars to the Detroit & Bay City road.

The Latrobe (Pa.) Car Works are building two baggage cars, 20 box cars, 20 coal dump cars and 20 ballast cars for the Pittsburgh, New Castle & Lake Erie road.

Hussey, Howe & Co., in Pittsburgh, are adding to their steel works a seven-ton Siemens-Martin furnace.

The Lawrence Iron Works, at Ironton, O., are to start up again soon.

The Laclede Rolling Mill, at St. Louis, has started up again, after the usual yearly stop for repairs. All the mills are at work.

The Edge Moor Iron Works, near Wilmington, Del., have been making portable railroad tracks to go to Cuba for use on sugar plantations.

The buildings of the Missouri Car & Foundry Co., in East St. Louis, Ill., were destroyed by fire on the night of Sept. 26, together with the Ohio & Mississippi round-house adjoining. Twelve buildings in all were burned, the loss being estimated at $125,000, partly covered by insurance. Engines were brought over from St. Louis, but the supply of water was so small that nothing could be done.

The Central Vermont shops, at St. Alban's, Vt., recently turned out a new 40-ton freight engine. The shops are very busy at present.

The Goderich (Ont.) Foundry Co. is making a lot of car-wheels for the Canadian Pacific.

The Ontario Car Works, at London, Ont., are making 70 freight cars for the Canadian Pacific road.

The Rhode Island Locomotive Works, at Providence, are building a heavy passenger engine for the Boston & Providence road.

The Portland (Me.) Rolling Mill has started up again, with orders for 2,000 tons of rails and a large quantity of merchant iron.

Bridge Notes.

Morison, Field & Co., of Buffalo, N. Y., are building a bridge over the Androscoggin River, at Lewiston, Me., with three spans of 158 ft. each. They have also contracted to build six spans of riveted lattice, 882 ft. in all, for the Chicago & Eastern Illinois.

Kellogg & Maurice, at Athens, Pa., are at work on the posts and trusses for the Chatham street Branch of the New York Elevated road. The iron is being rolled by the Pottsville Rolling Mills and the Pencoyd Iron Works in Philadelphia.

Notes.

The course of empire is taking its way westward with such great unanimity that the man who gets a whole wood box to himself on the C., B. & Q. trains travels like a bloated bondholder and a grasping monopolist.—*Burlington Hawkeye.*

Most people like to have their debtors pay up, but in New England some of the creditors of a company have begun suit to prevent the payment of its debts.

Prices of Rails.

Quotations for 50-lb. rails free on board at English ports are £4 15s. for iron, and £5 15s. for steel—$23.13 and $28 respectively. Here quotations are $32 to $36 for iron, and $42 to $45 for steel.

Steam Street Cars.

A new separate motor is to be tried in Pittsburgh on the Oakland & East Liberty Street line, the necessary permission having been obtained from the City Council. The motor is one designed by Gen. J. D. Imboden, of Richmond, Va., and was built in the shop of McLanahan, Stone & Bailey, at Hollidaysburg, Pa.

Not His Trunk.

A stranger sat in a corner of the car hence to New York, in easy attitude, his feet upon a large black trunk. The gentlemanly conductor, going his rounds, at the first station politely informed the stranger that the trunk must be put in the baggage car. To which the stranger nothing replied. At the second station the displeased conductor, more decidedly, told the stranger that he must put the trunk in the baggage car. To which the stranger nothing replied. At the third station the vexed conductor more imperatively told the stranger that he must put the trunk in the baggage car or it would be put off the train. To which the stranger nothing replied. At the fourth station the irate conductor had the trunk put off and left. At the fifth station the mollified conductor, addressing the stranger, begged him to remember that he had but done what his duty required, and that he had only done it after repeated warnings, and that it was solely the stranger's fault. To which the stranger laconically replied: "Don't care; 'taint my trunk."—*Boston Courier.*

An American Locomotive in Italy.

The Reading (Pa) *Journal* says that the locomotive exhibited at Paris by the Philadelphia & Reading Railroad Company is to be sent to Italy after the close of the exhibition, for trial on a railroad in that country. The company has already sent out an engineer to run it.

A Terrible Disaster.

Wednesday morning the passenger train south on the Keokuk Division was lifting itself right off the rails. She was running so fast the noise of the wheels was rattling along about two hundred yards behind the train, doing its level best to keep in sight but losing ground every jump. Suddenly the train stopped. Away out between stations, no cattle on the track, no water tank in sight, nothing apparently to stop for. She pulled up so close to an orchard that the farmer came out and sat on the fence with a gun in his hand and a couple of bold, bad dogs, looking deceitfully pleasant, tagging along at his heels. He evidently didn't care about setting up the apples. The passengers were alarmed, not at the determined neutrality of the farmer, but at the sudden stoppage of the train. They knew something serious had happened. Presently the fireman came walking down along the side the track, looking carefully, as though he had dropped his diamond out of the cab window.

"What is it?" asked the first passenger.
"What is the matter?" asked the second passenger.
"What has happened?" asked the third passenger.
"What broke?" asked the fourth passenger.
"Why did we stop?" asked the fifth passenger.
"What's up?" asked the sixth passenger.
"What's broke loose?" asked the seventh passenger.
"What done it?" asked the eighth passenger.

"Broke a spring hanger," gravely replied the fireman, and passed on, and all the questioning passengers drew their heads back and closed their windows, and with great gravity was repeated the fireman's statement to the other passengers who had not been able to get to a window in time to ask the fireman anything:

"Broke a spring hammer."
"Broke a sling hainer."
"Broke a screen hanger."
"Broke a string hammer."
"Broke a sting ander."
"Broke a scene hanner."
"Broke a steam hammer."
"Broke a swing hanger."

And if Benjamin F. Franklin and George W. Washington and Christopher C. Columbus had been in that coach, they couldn't have looked wiser nor been more thoroughly ignorant of the nature of the accident than the awe-struck passengers who imparted and received this information, and tried to look as though they weren't wondering what it was. There should be a law compelling railroad people to speak United States when imparting information relative to the nature of accidents to the inquiring passengers. There wasn't a passenger in that coach that ever expected to see good Dave Blackburn or the engineer alive again. We all supposed that when a spring hanger broke, it just tore the engine all to pieces, stood it on end and rammed it into the ground, and then ran on ahead, tore up the track, set fire to a bridge and blew up a culvert. The average passenger has an idea that a spring hanger owns about the whole engine; that it is one of these things that can even swear at a brakeman and walk up to a baggageman and call him a "wooden-headed, flat-backed, trunk-liftin' hurricane of wrath," and consequently when a passenger is told that the spring hanger is broke, he has an impression that it will take every last dollar there is on the train to set the old thing up again.—*Burlington Hawkeye.*

Government Contracts.

Lieutenant-Colonel John Newton, United States Engineers, will receive, until Oct. 15, at the United States Army Building, Houston and Greene streets, New York, proposals for constructing pile dykes in the Hudson River, near Albany, N. Y. Also, for furnishing and driving about 10,000 piles in the Hudson River, below Albany, N. Y. Forms of bids and other information can be had at the office, as above.

Speed of an English Locomotive.

A correspondent of the *English Mechanic* contributes the following interesting observations of the speed between different stations of a fast train on a 91½ mile run on the London & Northwestern Railway. The run is almost exactly of the same length as that between New York and Philadelphia, and the speed quite similar to that of the "fast train" on the latter:

"Perhaps it may interest some of our readers to see a late performance of a single engine with a Scotch express train, which will show, I think, that they can do something yet.

L. & N. W. R. ENGINE 887—LOAD, 14 LARGE COACHES—WEATHER DULL.

			P. m.	Speed.
...	Nuneaton	(leave)	5:48	.....
3½	Bulkington	(pass)	5:54½	31.11111
5¾	Shilton		5:57 5-12	50.625
9	Brinklow		6:1 1-6	52
14¼	Rugby		6:8 1-12	*45·54217
21¾	Crick		6:19½	40
27½	Weedon		6:25 7-12	55.2
34	Blisworth		6:33 1-6	51.42857
37	Roade		6:37 1-6	45
44¾	Wolverton		6:45 5-12	56.36363
50¼	Bletchley		6:52 1-6	48.88888
56¾	Leighton		7:00 1-6	48.75
60¾	Cheddington		7:05 5-12	45.57142
65¼	Tring		7:12 5-12	38.57142
69	Berkhampstead		7:17½	44.26229
72½	Boxmoor		7:21¼	56
76	King's Langley		7:24 11-12	57.27272
79½	Watford		7:28¾	54.78260
81	Bushey		7:30 5-12	54
83¾	Pinner		7:33 11-12	†47.14285
85¾	Harrow		7:36 1-6	53.33333
89	Sudbury		7:39 5.6	53.18181
91½	Willesden	(arrive)	7:43¾	43.90244
				22)1073.07310
	Average			48.77605

* Slacked through station. † Picked up water.

"I timed this train past all the mile-posts from the 81 to the 27. The quickest mile was 1 min. 1 sec.; the slowest, 1 min. 43 sec. The Kilsby tunnel was cleared in 2 min. 5 sec.; the Stove Hill, 19 sec.; Linslade, 11 sec.; North Church, 14 sec.; and Watford tunnel, 1 min. 8 sec."

OLD AND NEW ROADS.

Allegheny Valley.—The following notice is dated Sept. 28:

"The fund applicable to the payment of the interest due Oct. 1, 1878, on the income bonds of the Allegheny Valley Railroad Company being insufficient to pay the whole of such interest, the amount of the fund will be distributed *pro rata*, according to the terms of the bonds, allowing the sum of $12.50 for each $35 coupon, and proportionately for smaller amounts, to be paid in cash; and for the balance of the coupons, bonds of the same issue and scrip convertible into such bonds for the sums that may be due less than $100 will be issued according to the conditions of the bonds. Coupons may be presented at the office of the company in this city on and after Oct. 1, where the cash payments will be made and an order will be given on the trustees for the bonds and scrip."

Ashtabula, Youngstown & Pittsburgh.—The bondholders and stockholders of this company met in Youngstown, O., Sept. 25, and organized the Ashtabula & Pittsburgh Company, in accordance with the agreement of re-organization executed May 16, 1878. The road, which is worked by the Pennsylvania Company, and extends from Youngstown, O., to Ashtabula, 62⅓ miles, was sold under foreclosure of the first mortgage on Aug. 24, and bought in by trustees under the agreement.

Atchison, Topeka & Santa Fe.—The contracts for grading this company's New Mexico & Southern Pacific line from Willow Springs, N. M., to Las Vegas have been awarded as follows: Hunt, Edwards, Towne & Co., of Macon, Mo., 40 miles; Houston & Neely, Chattanooga, Tenn., 20 miles; William Moore, South Pueblo, Col., 15 miles; V. R. Blush & Co., Trinidad, Col., 12 miles; William Garland, El Moro, Col., 8 miles; Fitzgerald, Mallory & Flynn, Trinidad, Col., 8 miles.

Articles of consolidation of the Pueblo & Arkansas Valley and the Cañon City & San Juan companies have been filed with the Secretary of State of Colorado. The Pueblo & Arkansas Valley is the organization under which the Atchison, Topeka & Santa Fe's line was built from the Kansas line to Pueblo, and its name is retained by the consolidated company. The line of the road now owned or to be built is thus described by the Denver *Tribune*, quoting partly from the articles filed:

"The line is to commence at the terminus of the Atchison, Topeka & Santa Fe Railway at the western border of the state, and run to Pueblo (already built). This, the main line, will continue from Pueblo to Cañon City, thence through the Grand Cañon of the Arkansas through Tennessee Pass, passing through Park, Lake and Summit counties to the western boundary of the state of Colorado.

"Ten branches are provided for. The first of these (already very nearly completed) is to run to Trinidad and to the southern boundary of the state.

"The second is to go up Coal Creek from the Arkansas River into Custer County.

"The third is to leave the main line at the mouth of California Gulch, penetrate that to Leadville and pass on to Oro City.

"The fourth is to proceed up Poncha Creek and through Poncha pass into San Luis Valley to Saguache and Del Norte thence up the Rio Grande River to the headwaters, through Wagon Wheel Gap and Antelope Park; through Cunningham Gulch to Baker's Park and down the valley of the Animas to the mouth and thence down the Rio San Juan.

"The fifth branch is to pass through Lake and Gunnison counties, up Poncha Creek to Marshall's Pass to the continental divide, down Temichi Creek to the valley of the Gunnison River, through the cañon of the Gunnison to the junction with the cañon of Cebolla, and thence up this cañon to the divide between Cebolla and Uncompahgre rivers; down the valley of Cedar Creek to the Uncompahgre, and again back to the valley of the Gunnison and along it and the Grand to the western boundry of the state.

"The sixth branch will go up the stream of Lake Fork, from its junction with the Gunnison to Lake City.

"The seventh will proceed to Ouray along Cedar Creek.

"The eighth is to pass through Antelope Park, starting near the mouth of Clear Creek, to Lake City.

"The ninth branch is to proceed from Saguache through Cochetopa Pass to Temichi Creek.

"The tenth branch is to leave the main line at Pueblo, go thence to Colorado Springs, along the Fontaine que Bouille, and to Denver, going from Denver to Black Hawk and Central, and thence to Georgetown by way of Fall River."

It is not probable that all these branches will be built, but the articles are made to cover extensions which may be found desirable hereafter.

Central of New Jersey.—The so-called blanket mortgage for $5,000,000, executed Sept. 1, 1876, covering all the property of the company and having a special lien upon certain stocks and bonds of its leased and controlled lines held by the company, has been duly canceled and discharged of record. Such bonds as were issued under the mortgage were not sold, but used as collateral.

Chautauqua Lake.—President Lewis of this company feels called upon to issue a circular saying that there is not a single vacancy on the road. He says: "We must employ no more men than we can pay every month. This company is entirely free from debt and intends to remain so. This company will keep in its employ every faithful, vigilant old servant, as long as it needs their services. So far as is known, there is not a single intemperate person connected with it, and there never will be if we can prevent it. Hence there is no probability of any vacancies."

The road is the old Buffalo, Corry & Pittsburgh, and was bought by Mr. Lewis from the parties who purchased it at foreclosure sale. It runs from Corry, Pa., to Brocton, N. Y., 43.8 miles, passing along the head of Chautauqua Lake, only three miles from the Fair Point meeting grounds. The company is now laying new 60-lb. rails to replace the old 56-lb. iron.

Chicago, Burlington & Quincy.—It is reported that a contract has been let for the grading of the proposed branch from Chariton, Ia., north by west to Indianola, about 28 miles.

Chicago, Clinton, Dubuque & Minnesota.—The reported sale of this road to the Chicago, Burlington & Quincy Company is denied on good authority.

Chicago & Indiana.—A meeting was held in Chicago, Sept. 27, to consider the question of building a new road from Chicago to the block coal fields of Indiana. It was stated that the object was to build a line from Chicago southeast into Lake County, Ind., and thence south to Attica, on the Wabash road, about 115 miles in all. Parties present said that 20 miles of road-bed on the proposed line could be had, and also the right of way into Chicago and 11 miles of road-bed owned by the Chicago & South Atlantic Company. A committee was appointed to consider the project and report to a future meeting.

Chicago, Milwaukee & St. Paul.—The St. Paul *Pioneer-Press* says that this company will probably build a line between St. Paul and Minneapolis, and adds: "The line as surveyed and located leaves the present line of the road at a point about four miles below the city limits, crosses the river at a point about 1½ miles above Minnehaha and strikes the company's track in St. Paul near Spring street.

"The distance from station to station, via this line, is a trifle less than 11 miles, and they propose to run their trains over it in 25 minutes.

"And, best of all, we are assured that work will be inaugurated upon 'the short line' as early as possible, and that it will be completed and in running order early next season."

Chicago, Rock Island & Pacific.—This company issues the following circular, dated Sept. 26:

"The Keokuk & Des Moines Railway and equipment having been leased by the Chicago, Rock Island & Pacific Railroad Company, will be operated as the Keokuk & Des Moines Division of the last named road, on and after Oct. 1, proximo."

Cincinnati & St. Louis.—This company has been organized to build a narrow-gauge road from Cincinnati westward about 120 miles to Bedford, Ind. It will connect there with the Bedford, Springville, Owensboro & Bloomfield road.

Denver & Rio Grande.—This company's statement for August and the eight months ending Aug. 31 is as follows:

	August.	Eight months.
Freight	$76,242.52	$460,519.80
Passengers, mail and express	44,202.59	217,340.95
Miscellaneous	146.40	1,984.42
Total	$120,651.51	$679,845.17
Expenses	60,881.65	399,049.57
Net earnings	$59,769.86	$280,795.60
Per cent. of expenses	50.46	58.68

August earnings include $4,091.11 from mails and other Government business. For the month there was an increase of $36,079.39, or 43 per cent., in gross, and of $13,660.10, or 30 per cent., in net earnings.

Des Moines & Fort Dodge.—It is reported that the Chicago, Rock Island & Pacific Company is negotiating for a lease of this road, with which it connects at Des Moines. The road extends from Des Moines to Fort Dodge, 88 miles, and is the northern end of the old Des Moines Valley road, which was broken in two at the time of the foreclosure sale several years ago. The Rock Island Company has already leased the Keokuk & Des Moines, the southern section of the Valley road.

Detroit & Milwaukee.—The Detroit *Post and Tribune* of Sept. 28 says: "Yesterday was the last day for filing exceptions to the recent chancery sale of the Detroit & Milwaukee railroad. No exceptions were filed; therefore, by virtue of that fact, the sale stands confirmed. The re-organization of the company will now proceed in accordance with the plan previously agreed upon. The opponents of that scheme seem to have exhausted their hostile resources."

Eastern.—A special meeting of stockholders was held in Boston, Sept. 30, to consider the question of approving the amended leases of the Eastern in New Hampshire, the Portsmouth, Great Falls & Conway and the Wolfeboro railroads. Pending a vote a recess was taken until Oct. 7, the polls to be kept open meanwhile.

Empire Transportation Co.—The Pennsylvania Court of Common Pleas has granted a decree directing that this corporation be dissolved and its assets distributed to the proper owners. This is in accordance with the action taken by the stockholders when most of the property was sold to the Pennsylvania Railroad Company, and is in response to the subsequent petition filed by the company.

The report submitted to the Court shows assets available for distribution amounting to $1,050,395, of which $50,395 is in cash, and $1,000,000 in bonds of the Erie & Western Transportation Company.

Fond du Lac, Amboy & Peoria.—In the existing suit against this company in the United States Circuit Court, a cross-bill has been filed by Alonzo Kenyon, who claims damages for loss of profits from a contract for the construction of the road, owing to the failure of George H. Wellman and others to carry out the provisions of an agreement under which two-thirds of the contract was assigned to them.

Fort Madison & Northwestern.—This company has offered to build its road by Jan. 1, 1879, from Fort Madison, Ia., northwest to West Point, 11 miles, provided the West Point people will raise money enough to build the bridge over Pitman Creek, and grade and tie the road thence to West Point, about four miles.

Fort Wayne, Jackson & Saginaw.—In the foreclosure suit begun by the trustees in the United States Circuit Court, argument was heard in Chicago, Sept. 27. John M. Dennison and James F. Joy are trustees of both mortgages, the first for $1,500,000 and the second for $500,000, and they have been notified to foreclose by holders of the required number (one-third) of the bonds. The mortgages give power to the trustees to sell the road on twelve weeks' public notice, and there seems to be no question as to the right to sell, the argument having been chiefly on a motion to put the trustees in possession until the sale can take place. The Court reserved its decision.

Great Western, of Canada.—A cable dispatch from London, England, says that the directors of this company have announced that, after paying the interest on the terminable bonds and debenture stock for the past half-year, there will be no balance remaining for the payment of dividends on the preference stock.

Gulf, Colorado & Santa Fe.—The contract with Dennistown, Cross & Co., of London, to place $2,700,000 of the bonds of this company, was ratified at a special meeting held in Galveston, Tex., Sept. 16, the stock vote standing 6,748 for to 28 against ratification.

Of the $200,000 bonds to be disposed of by the company in Texas, $132,000 have been subscribed for in Galveston.

Hartford, Providence & Fishkill.—On Sept. 30 notice was served on the trustees of a suit began in Connecticut similar to the one pending in Rhode Island, which was begun by some of the stockholders to set aside the contract, under which the New York & New England Company claims the right to take possession of the road on paying off the bonds. It is probable that the Court will be asked to enjoin the trustees from making the transfer, although the New York & New England has the money on deposit to pay the bonds. That company was also given notice that it will pay, with the principal of the bonds, the coupon passed in 1858, with 20 years' interest thereon; also that interest on the bonds will cease from Oct. 1.

On Oct. 1 about $225,000 of the bonds were presented by holders for payment. The trustees have taken no action toward the transfer of the road as yet, and will probably wait until the end of the suits now pending.

Indianapolis, Bloomington & Western.—In Chicago, Sept. 26, argument was had before the United States Circuit Court on the question of modifying the decree of foreclosure so as to permit of redemption in accordance with the laws of Illinois and Indiana. In opposition it was argued that the decision of the Supreme Court relied upon did not apply in this case, as the state laws only covered the case of private property sold under foreclosure and did not apply to the property of public corporations, such as railroads. The Court reserved its decision.

Kansas Pacific.—A meeting of the Denver Extension bondholders was held in New York, Sept. 30, at which the committee of nine submitted their report. There are now on deposit at the United States Trust Company Denver Extension bonds to the amount of $3,491,000, and certificates of interest to the amount of $85,365. A full statement was made of all the negotiations that had been conducted between the committee and the Union Pacific pool, and of all the grievances of the Denver Extension bondholders. A resolution was adopted sustaining the past course of Mr. Henry Villard, one of the receivers of the road, and denouncing the conduct of Mr. Greeley, the other Receiver, as having been inimical to the interests of the bondholders. The report of the committee of nine was approved, and a committee of three, consisting of L. H. Meyer, William Bond, of New York, and Alfred Morrison, of Boston, was appointed to draft a plan for the re-organization of the company, based on the committee's report, which will be submitted to a meeting of the bondholders on Oct. 18.

The report of the bondholders' committee contained the following statement of the operation of the road under the receivers:

Gross earnings from Nov. 21, 1876, to Sept. 15, 1878		$5,896,007
Operating expenses, including taxes and insurance		3,826,854
Approximate net earnings		$2,069,152
Less government transportation not paid, about	$275,000	
Less company transportation not paid, about	180,000	
		455,000
Available earnings		$1,614,152

This allows about $895,000 per annum for interest on first-mortgage bonds. Deducting the interest charge on the first-mortgage bonds and certificates of the Eastern and Middle Division, amounting to $429,234, there is left $465,765 per annum applicable to Denver Extension bonds and certificates, the whole amount of which, including unfunded passed coupons, is $8,171,917. The available earnings ($1,614,152), to which should be added for receiver's certificates outstanding about $84,000, making an aggregate of $1,698,152, have been disbursed substantially as follows:

Expenses incurred prior to the receivership	$738,437
Interest paid on funded debt	781,681
Advanced to Denver Pacific Railway and Telegraph Company	127,386
Assets on hand in excess of amount turned over to receivers	50,648
Total	$1,698,152

The liens prior to the Denver Extension mortgage, including bond principal, unclaimed coupons, funded interest and unfunded passed coupons, amount to $7,398,804; on the Eastern Division, $2,542,429, and on the Middle Division, $4,856,375. The unclaimed coupons and unfunded passed coupons, amounting to $244,899, constitute a present liability, and after paying this amount the interest charge upon the remainder will be $429,234 per annum. The funded interest, amounting to $850,905, falls due in 1883-84. The government lien upon the road amounts, principal and interest, to $9,008,902, none of which is due, under existing laws, until about 1896. The committee's report says: "It is believed that a law similar to that already passed for funding the government indebtedness of the Union and Central Pacific railways will be enacted at an early day for the Kansas Pacific, it having passed the Senate at the last session of Congress. This law will take not more than 25 per cent. of the net earnings after deducting first-mortgage interest, and in the computation of the said 25 per cent. allowance will be made for the whole of the government transportation. The unsubordinated income bonds, amounting to $225,000, are possibly a lien prior to the Denver Extension mortgage. The status of these bonds will be determined by the foreclosure suit."

The mortgage on the Leavenworth Branch, including bond principal, unclaimed coupons, funded interest and unfunded passed coupons, amounts to $766,972. The total indebtedness of the Kansas Pacific road is $25,571,595. The committee recommended that, in preparing a plan for the re-organization of the company, due regard should be had for all prior liens. They stated that they considered that the property justified payment in full of the Denver Extension bonds and accrued interest, which should be secured in the plan of re-organization by a new mortgage or otherwise. The committee further suggested that the reception of bonds by the United States Trust Company should be continued until such time prior to the foreclosure sale as may be deemed advisable.

Kankakee & Southwestern.—The track on this road is now laid to a point 17 miles west of Otto Junction on the Illinois Central and beyond the bend which the road takes to the southwest to reach Chatsworth. Two stations have already been established and freight and passengers will soon be taken, although regular trains will not begin to run until the road is finished. A large force is employed and the work is advancing very fast. The ballast train follows up the track-layers as close as possible.

Madeira & Mamore.—A correspondent of the New York *Herald*, writing from a steamer engaged in surveying the upper Amazon and the Madeira River, under date of Aug. 2, says of this enterprise, which the Collins Brothers, of Philadelphia, have under contract:

"From the officers who have returned from San Antonio your correspondent has been able to obtain full information respecting the condition of affairs there. The reports of deserters and refugees, who at different times have come on board of the Enterprise, have been so gloomy, and have pictured the distress of the employés of the contractor in such dark colors that it is a pleasure to be able to state that their stories are greatly exaggerated.

"The state of affairs there is precisely that which would naturally be expected when the difficulties of the task are taken into consideration. The laying of a railway through nearly two hundred miles of tropical forest is a labor that cannot be accomplished save at an expense of strength, health and life, and when it is remembered that the laborers now employed there were recruited from a class unused to this kind of toil, it is surprising that more have not been fatally stricken. That many should succumb temporarily was to have been expected. A process of acclimation must always be gone through by those who change their environment, and the laborers of San Antonio have merely followed a natural law in falling sick. The position of the starting point of the railway renders it peculiarly liable to diseases of a malarial nature. It is surrounded by collections of stagnant water, and is backed by a network of lagoons and ponds which are but propagators of poison. Its air is continually moist, not only from natural causes, but mechanically so from the mist which rises from the falls above. During the day the thermometer ranges among the eighties, but at night it sinks so low that the air is cool, almost cold. All of these physical causes operate in favor of disease and against those who are employed.

"There has been, in addition to all this, a lack of care on the part of the contractors. Food of a proper quality and medicines for the cure of those suffering from malarial fever have not been supplied, and, consequently, those who have succumbed have suffered acutely. It is hardly to be expected that the Messrs. Collins should have foreseen all the impediments in their way, or that they should have known at the outset all of the conditions to be fulfilled; but there has been ample time since the first case of sickness for them to have built a temporary hospital and for the arrival from the United States of a generous supply of delicacies and medicines. In consequence of this neglect the force of workingmen is much diminished. A few weeks since more than fifty per cent. were on the sick list, and even now, when those first attacked have convalesced sufficiently to go to work, not more than a third of the original number engaged muster at the call of the roll. Desertion and disease have quenched the rest. Sickness has been a great blow against the success of the work, but other causes have operated to produce the discontent that exists. The money for the payment of the laborers has not been forthcoming, and hence a strong feeling of dissatisfaction, amounting almost to open mutiny, has arisen. In contracting to build the railway the Messrs. Collins expected to receive a large sum as soon as four miles of the road were completed. This has not been paid, for two quite good reasons. Four miles of the road are not completed, and the money is locked up in the Bank of England under the care of two trustees, who are enjoined from paying any of it out. The money from which the payment for four miles of the road, and, in fact, for the construction of the whole road, is to be drawn amounts to $4,000,000, and is amply sufficient to build the railway. It, however, is in litigation, being demanded by no less than four parties—the original bondholders, the second bondholders, the government of Bolivia and the Madeira & Mamore Railway Company. The original bondholders pressed their case so strongly, alleging that the road was impracticable, and that the money would be wasted in futile attempts, that the English judge before whom it was argued placed the treasure in the hands of two trustees, who were ultimately to have divided it among those who had subscribed for the bonds. This operation, however, did not take place, owing to the injunction of the Madeira & Mamore Railway Company. The justice of this measure will be argued, it is said, in October next. Of course it is impossible to tell how the Court will decide. If the report of the English construction company, which after spending a million of money declared the work impracticable, be taken, it is possible that the money will be returned to those who own it, and if this decision obtains the Messrs. Collins and their backers, presumably the Pennsylvania Railway Company, will be minus the amount already expended. This chance of loss has hampered the contractors and embarrassed all their operations. To it may be ascribed the many economies the Messrs. Collins have practiced to the prejudice of their employés.

"A great deal of pluck, however, has been shown. Despite of sickness, dissatisfaction, want of food and other depressing causes the labor goes on. Four miles of difficult work are completed and over two miles of rails laid. Beyond the

graded portion a stretch of seventy miles is mapped out, and beyond this still a number of Indians, employed by Bolivian officials, are hard at work cutting timber and preparing the way for the tracklayers. This shows that the contractors are in earnest. They may well be so, for if they gain at all they gain enormously. If the money is untied to them, and if Brazil furnishes $2,000,000, as it is said she has promised to do, the profit will be immense, for the road, despite the assertions of the English engineers, is an easy one to build.

"It is useless to disguise the fact that the people at San Antonio are suffering. Dejection is everywhere present. Pallid faces meet one at each turn, and the forms of men weakened by fever totter about the roads. Collins himself is sick; many of his engineers are sick, and most of the men are either down with fever or convalescent from it. Many have already deserted, while those who remain wish to leave. The doctors are overworked; not a grain of quinine is in store; provisions are scarce and bad; delicacies are not to be had; poisonous gnats render the day of the laborer a continual struggle and that of the sick a protracted misery. There is no fruit, and no money to buy it were it plentiful. The ice machine is broken, and, in fact, nature and the cupidity of man seem to have conspired against the comfort and lives of the men who left the United States to seek fortune amid the falls of the Madeira."

Metropolitan Elevated.—The Grand Jury of the Court of General Sessions in New York has made a presentment against this road as a nuisance. The presentment is made after investigation on complaint of a number of citizens made to the jury. The jury, after stating that the road is in itself an unwarrantable invasion of public and private rights and a grievous nuisance, and its opinion that the Legislature would not have granted a charter for the road, had all the attendant evils been anticipated, proceeds to specify several matters, which it holds to be unnecessary evils, which could and should be remedied at once. These are the dropping of oil and cinders from the engines upon foot-passengers and vehicles in the street; the smoke and gas from the engines, and, above all, the great noise made by the trains. While it is not held that the noise can be stopped altogether, it is thought that it might be greatly diminished, and that the running of trains at night, when there are few passengers and the noise is most heard, might be stopped. The presentment will be referred to the Attorney General for action thereon.

A complaint against this company and the New York Loan & Improvement Company has been prepared and submitted to the Attorney General. It sets forth that the Improvement Company has not been properly organized according to law; that the Metropolitan Company did not comply with the law requiring 10 per cent. of the stock subscriptions to be paid in in cash, but that all the stock was delivered to the Improvement Company. It charges further that the contract for the construction of the road by the Improvement Company was made at an exorbitant figure, and that the mortgages put on the road are so great in amount that the company will be unable ever to reduce fares as contemplated by its charter, and its creditors will be unable to recover amounts due or claims for damages which may be recovered. The Attorney General is asked to bring suit to have the Improvement Company dissolved, the contract with it declared void and to have the Metropolitan Company restrained from issuing any more stock or bonds except for the construction and operating of the line, and from the further issuing of any bonds under the contract.

Michigan Lake Shore.—The following circular is dated Sept. 28, 1878:

"The Michigan Lake Shore Railroad having been sold under its mortgage and purchased by the bondholders, a new corporation has been by them organized for the purpose of operating it under the name of the Grand Haven Railroad Company.

"All business, traffic and communications previous to Oct. 1, 1878, for September business, should be reported to and arranged by D. P. Clay, Receiver, Grand Rapids, Mich.

"On and after Oct. 1, 1878, all reports for same should be made to and arranged by Fred. H. May, Manager, Allegan, Mich.

"Existing arrangements, contracts, etc., with other companies will be respected unless notice is given to the contrary. * *

"All car-mileage on cars marked Michigan Lake Shore Railroad should be reported to Fred. H. May, Manager Grand Haven Railroad."

The road is 57¼ miles long, from Allegan, Mich., to Muskegon.

Nashua & Lowell.—From Oct. 1 this road is worked independently, the contract under which for 20 years it has been worked jointly with the Boston & Lowell having expired. It is stated, however, that the negotiations for the lease of the road to the Boston & Lowell are nearly completed, and that the lease will be submitted to the stockholders as soon as the legal notice for a special meeting can be given. The suit to enjoin such a lease comes up before the United States Circuit Court this week, and something depends upon its result.

New York Central & Hudson River.—The Buffalo *Commercial* of Sept. 28 says:

"On the 23d inst. a bill of exceptions on the part of the defendant in the case of the New York Central & Hudson River Railroad Company *vs.* John M. Bailey, was settled at Syracuse by Judge Wallace.

"It will be recollected that in June, 1874, in the United States Circuit Court at Canandaigua, the case was tried before Judge Wallace, and he directed the jury to render a verdict for the company for $594,002.89, taxes and interest claimed to have been illegally exacted by the defendant as Collector of Internal Revenue. Hon. Richard Crowley, attorney for defendant, then carried the case to the United States Supreme Court by a writ of error, and that Court reversed the judgment of the Circuit Court, and remanded the case for a new trial.

"The new trial was had before Judge Wallace at Utica last March, Mr. Choate, a law-partner of Hon. William M. Evarts, and S. T. Fairchild, appearing for the company, and Mr. Crowley for the defendant. The trial occupied a week and resulted in a verdict for the company of $499,432.68 taxes and interest.

"Another writ of error is to be sued out by the defendant, and the case will again be reviewed in the United States Supreme Court.

"The amount collected was about $600,000; and it was paid into the United States Treasury. The case is of importance to the Government as well as to the company."

New York Elevated.—This company recently has been reporting the number of passengers carried daily on both of its lines. For the six days ending with Saturday, Sept. 28, the West Side (old) line carried from 13,361 to 13,761 passengers per day, and the East Side line from 42,507 to 54,141. The latter is in operation about half a mile further north than the former. Sunday, Sept. 22, the West Side line carried 9,374 passengers. The following Sunday the East Side line was open for the first time on Sunday, and its business is reported as 34,000 passengers, approximately, apparently with the effect of reducing the travel on the West Side line, which for the same day is given as approximately 6,000 passengers—not two-thirds that of the previous Sunday. As the Metropolitan (Sixth avenue) line is not open Sunday, the New York Elevated has the whole of the business on that day, and as there are no 5-cent fares for four hours on Sunday as on other days, the business is probably about as productive on that day as on week days, when the travel is much larger.

Oil Transportation.—The investigation into the charges made by the oil producers against the Standard Oil Company and the oil-carrying roads was resumed at Harrisburg, Pa., Sept. 25. Some more testimony was taken to show the refusal of the companies to carry oil for outsiders. On account of the absence of witnesses the investigation was then adjourned to this week, at Pittsburgh.

Oregon & California.—A meeting was held in Frankfort, Germany, Sept. 30, at which $2,811,000 bonds of this company were represented. It was resolved by a large majority to approve the proposition of the committee for acquiring possession of, and completing the Oregon Central Railroad. Also, to accept the financial propositions made for that purpose.

Peoria, Pekin & Jacksonville.—A recent telegram, reporting the bridge over Indian Creek, on this road, destroyed by fire, causing several days' interruption to travel, was much exaggerated. The bridge was only slightly damaged, and was repaired in a few hours.

Philadelphia & Atlantic City.—Notice is given by John H. Burrell, Jr., Trustee of the unpaid employés of this company, that all persons who have presented to him for collection the amounts of their labor claims against said company, without also presenting the orders and certificates therefor, are hereby requested to present the said orders and certificates *at once*, in order that the same may be properly presented and proved before the Master in Chancery, who is to report thereon. Mr. Burrell's address is "Green street, Germantown, Philadelphia, Pa."

Philadelphia & Reading.—This company's statement for August and the nine months of its fiscal year ending Aug. 31 is as follows:

	August.		Nine months.	
	1878.	1877.	1878.	1877.
Gross earnings:				
Railroad	$1,217,542	$1,248,716	$8,303,276	$8,545,814
Canal	119,115	103,400	584,906	625,097
Steam colliers	49,001	50,619	408,743	489,345
Richmond b'rg's.	16,534	18,144	68,019	90,071
Total R. R. Co.	$1,402,792	$1,420,879	$9,364,944	$9,750,327
Coal & Iron Co.	950,826	1,202,785	5,530,208	6,780,919
Total	$2,353,618	$2,623,664	$14,895,152	$16,531,246
Traffic:				
Passengers carried	555,914	588,929	4,710,297	4,890,260
Tons freight	280,015	320,176	2,337,658	2,311,351
Tons coal	683,076	755,709	4,082,460	4,962,781
Tons coal on colliers	62,960	60,076	435,501	428,976
Tons coal mined:				
By Coal & Iron Co.	341,129	420,398	1,910,012	2,560,766
By tenants	128,623	158,249	759,749	909,016
Total	469,752	678,647	2,669,761	3,469,782

The general business of the road continues very good.

Pullman Palace Car Co.—Notice is given that the five-year 7 per. cent. debenture bonds due Oct. 15, of which $603,000 are outstanding, will be paid at the office of the Farmers' Loan & Trust Company in New York. Interest will cease from date of maturity.

The company offers for sale, at the same office, $400,000 of its ten-year 7 per cent. debenture bonds, at par and accrued interest, with a rebate of 2½ per cent. to such holders of the old bonds as desire to take bonds of the new issue. The new bonds will be held to await orders from holders of the old bonds until Oct. 10.

Quebec, Montreal, Ottawa & Occidental.—A Montreal dispatch says that it has been decided to leave the questions at issue between the Quebec Government and Contractor McDonald to arbitration. Mr. Walter Shanly, one of the Shanly Brothers, who completed the Hoosac Tunnel, has been chosen as arbitrator.

St. Joseph & Des Moines.—Track on this road is now laid to Union, in DeKalb County, Mo., 23 miles northwest from St. Joseph. This section will be opened for business shortly. Work is being pushed on the extension of the road.

St. Louis, Iron Mountain & Southern.—In St. Louis, Oct. 1, the United States Circuit Court announced its decision in the foreclosure suit of the Union Trust Company, Trustee, against this company. The Court was divided, Judge Treat holding that the suit should be dismissed entirely, while Judge Dillon's opinion was that the application for a decree of foreclosure should be denied, but the suit continued. The latter held that the complainant was only entitled to a decree as respects the non-payment of interest on the consolidated mortgage bonds. The mortgage deed contains no provision that a default in payment of interest will cause the principal to become due, and hence there can be no foreclosure except for the interest due and unpaid.

A division of the Court will be certified, so that the case can be carried up to the Supreme Court.

St. Louis & Southeastern.—Auditor E. Young's report for the month of August is as follows:

	St. Louis Div.	Kentucky Div.	Tennessee Div.	Entire Line.
Gross earnings	$66,786.15	$34,171.88	$14,996.51	$115,934.54
Expenses	41,787.16	26,961.87	11,630.13	80,359.16
Net earn	$24,998.99	$7,210.01	$3,366.38	$35,575.38
Per cent. of expenses	62.53	78.84	77.53	69.28

Compared with August, 1877, the entire line shows an increase of $5,236.61, or 4.7 per cent., in gross, and of $4,786.72, or 15.5 per cent., in net earnings.

United Pipe Lines.—In the *quo warranto* suit against this company, begun in the Venango County (Pa.) Court, a demurrer has been filed. The complaint in the suit charged various illegal acts, such as discrimination in carrying oil, rebates in pipeage charges to favored persons, conspiracy with railroads to prevent equal use of transportation facilities, and also denied the right to carry on business in McKean County, through the lack of a charter.

The demurrer denies the jurisdiction of the Venango County Court, claiming that the bill should have been presented to the Supreme Court, on the ground that the complaint covers alleged transactions in several counties, and not exclusively in the one where the suit is brought. It also claims that the general law gives pipe lines authority to transport oil anywhere, though it does not confer right of eminent domain.

Utah & Northern.—This company has made application at Washington for the right of way through the Fort Hall Indian Reservation, claiming that it is entitled thereto by its charter. The matter has been under consideration, and the Government has decided not to grant it, unless the consent of the Indians on the reservation is first obtained. It is thought that this consent can be obtained, if proper measures are taken.

Utica, Ithaca & Elmira.—The Court has refused to grant a peremptory order giving this company the right of crossing the Syracuse, Chenango & New York road near Cazenovia. It sends the matter to a referee to take proofs in reference to the facts and report them to the Court.

Wabash.—This company is now paying, to holders who have assented to the funding scheme, the coupons which became due May 1 on Toledo & Wabash, Wabash & Western and Great Western second-mortgage bonds.

Washington City, Virginia Midland & Great Southern.—In the suit of Graham against this company, the Virginia Circuit Court has decided that the claims for labor and supplies furnished prior to the appointment of the Receiver have not any lien prior to the mortgages upon the road. The Court also held that interest at the rate of 6 per cent. a year should be allowed on past due coupons. As to the liens of the various mortgages, the Court decides that the Orange, Alexandria & Manassas first mortgage has a lien upon the old Manassas Gap road, from Manassas Junction to Harrisonburg, prior to that of the Orange & Alexandria mortgages; that is, that the clause in those mortgages covering property to be afterward acquired, did not apply to the property of the Manassas Gap Company when it was consolidated with the Orange & Alexandria. The Court holds that the executions issued under judgments at the time of the appointment of the Receiver were liens upon the funds then in hand, and if any of such funds have been used, they must be replaced from the earnings of the road and applied to the discharge of the said executions. The claim of Adams, Hamner & Co. for extra compensation is rejected, on the ground that it had been released by the act of claimants, when they assigned all their demands against the company to the Baltimore & Ohio. As to the claim of the Baltimore & Ohio to be subrogated to the right of the State of Virginia under the third mortgage decision is reserved.

Waynesburg & Washington.—This road has been seized by the sheriff of Washington County, Pa., and is advertised to be sold Oct. 18, at suit of W. W. Patrick, of Pittsburgh. The road is said to be doing well for a new line, but the company failed to sell bonds to pay off the floating debt, as intended, chiefly, it is said, on account of jealousy and trouble among the managers. The road is of 3 feet gauge, and was finished last year; it is 27 miles long, from Washington, Pa., southward to Waynesburg.

Wisconsin Central.—In the United States Circuit Court at Milwakee, Wis., Sept. 24, John A. Stewart and Edwin H. Abbott, trustees, filed a bill to foreclose the mortgage on this road, under which it states that $8,168,000 bonds have been issued, upon which interest is two years in default. The case was set for a hearing Oct. 7.

The company owns a line from Menasha, Wis., to Ashland, on Lake Superior, 249 miles, with a branch from Stevens Point to Portage, 71 miles. It was only completed through to Ashland last year, and two years ago the company asked holders to fund coupons to permit earnings to be used to finish the road. The road was built by an organization known as the Phillips & Colby Construction Company, which only transferred the property to the Wisconsin Central Company a few months ago.

The company leases the Milwaukee & Northern road, whose line is from Milwaukee to Menasha, 102 miles, with a branch from Hilbert to Green Bay, 27 miles.

The company owns a large land grant, much of it good timber land, but settlement has hardly reached the great body of its lands as yet, and most of the sales so far have probably been made for the lumber. Then the lumber business has been in so extraordinarily depressed a condition of late years that there could be little temptation to build new mills to utilize the forests which the road has made accessible.

Wisconsin Valley.—This company offers to extend its road from Wausau, Wis., northward to Jenny, provided Lincoln County will contribute $50,000 in cash and $60,000 in county bonds.

ANNUAL REPORTS.

Indianapolis, Cincinnati & Lafayette.

This company owns a line from Cincinnati through Indianapolis to Lafayette, Ind., 179 miles; the Greensburg Branch, from Greensburg, Ind., to some large stone quarries, 5.5 miles; the Harrison Branch, from Valley Junction, O., to Harrison, 7 miles, and the Hardentown Cut-off, 2.5 miles, making 194 miles in all. The main line from Cincinnati to the Indiana line, 20.5 miles, and the Harrison Branch are under nominally separate organizations. The Hardentown Cut-off, built to shorten and straighten the main line, was not completed until near the close of the year. The road is in the hands of M. E. Ingalls as Receiver in a foreclosure suit, and his report covers the year ending June 30, 1878.

The equipment consists of 52 engines; 37 passenger, 3 parlor, 1 chair, 6 postal and 13 baggage cars; 665 box, 51 stock, 66 coal, 283 flat and 19 caboose cars; 1 pay, 3 camp and two tool cars.

Being a receiver's report, no general balance sheet is given, but the following is a statement made of the company's liabilities:

Preferred stock	$1,419,300.00
Common stock	5,587,150.00
Cincinnati & Indiana stock not owned	18,000.00
Total stock ($36,209 per mile)	$7,024,450.00
Funded debt and unpaid coupons ($52,361 per mile)	10,158,004.27
Floating debt	528,491.19
Total ($91,294 per mile)	$17,710,945.46

A detailed statement of the funded debt is as follows:

	Total issue.	Outstanding.
First-mortgage bonds	$1,600,000.00	$1,600,000.00
Cin. & Ind. first-mortgage bonds	499,000.00	499,000.00
Cin. & Ind. second-mortgage bonds	1,501,000.00	1,497,000.00
Ind., Cin. & Laf. bonds of 1867	2,800,000.00	2,800,000.00
Unpaid coupons	810,663.19	810,663.19
Equipment bonds	423,000.00	344,000.00
Unpaid coupons	22,200.00	22,200.00
Funded coupon bonds from bonds of 1867	149,550.00	125,550.00
Bonds of 1869, third-mortgage	2,000,000.00	1,767,000.00
Funded coupon bonds from same	320,750.00	320,750.00
Unpaid coupons	371,841.08	371,841.08
Total	$10,498,004.27	$10,158,004.27

The $340,000 bonds included above as not outstanding are nominally held by the company, but have been pledged as security for floating debts. The company guarantees 40 per cent. of the interest on $525,000 bonds issued to build the Street Connection Railway in Cincinnati.

The traffic for the year was as follows:

Train mileage:	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passenger	523,968	540,999	D. 17,031	3.1
Freight	372,535	429,121	D. 56,586	13.2
Service	71,304	32,994	I. 38,310	116.1
Switching	169,710	166,376	I. 1,334	0.8
Total	1,135,517	1,169,490	D. 33,973	2.9
Car Mileage:				
Passenger train cars	2,598,437			
Freight cars	3,345,626			
Passengers carried	549,587	564,684	D. 15,097	2.7
Passenger mileage	18,971,743	19,244,431	D. 272,688	1.4
Tons freight moved	457,135	426,808	I. 30,327	7.1
Tonnage mileage	41,000,163	38,803,669	I. 2,196,494	5.7
Av. train load:				
Passengers, No	36.21	35.57	I. 0.64	1.8
Freight, tons	110.07	90.43	I. 19.64	21.7
Av. receipt:				
Per pass. per mile	2.67 cts.	2.59 cts.	I. 0.08 ct.	3.1
Per ton per mile	1.68 "	1.71 "	D. 0.03 "	1.8

The average rate per ton per mile on east-bound freight was 1.58 cents, and on west-bound, 1.82 cents; 59.6 per cent. of the tonnage mileage was of east-bound business. Of the freight car mileage, 78.1 per cent. was of loaded cars. Locomotive service cost 15.15 cents per mile run. Average earnings per train mile were: Through passenger trains, $1.41; local and commutation trains, $0.57; freight trains, $1.84. The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers	$493,984.84	$514,766.23	D. $20,781.39	4.0
Freight	683,470.23	684,739.81	D. 1,269.58	0.2
Express and mail	89,132.99	65,493.95	I. 23,639.02	36.1
Rents, etc	42,499.09	46,209.61	D. 3,710.52	8.0
Total	$1,309,087.13	$1,311,209.60	D. $2,122.47	0.2
Expenses	771,506.97	775,426.51	D. 3,919.54	0.5
Taxes	43,191.80	44,973.46	D. 1,781.66	4.0
Total	$814,698.77	$820,399.97	D. $5,701.20	0.7
Net earnings	$494,388.36	$490,809.63	I. $3,578.73	0.7
Gross earning per mile	6,818.16	6,847.05	D. 28.89	0.4
Net earning per mile	2,574.94	2,562.97	I. 11.97	0.5
Per cen. working exps	58.93	59.14	D. 0.21	0.4
Per cent. exps. and taxes	62.23	62.57	D. 0.34	0.5

The net earnings were 4.87 per cent. on the funded debt.

The Receiver's income account is as follows:

Balance, June 30, 1877		$194,007.77
Earnings		1,309,087.13
Total		$1,503,094.90
Expenses and taxes	$814,698.77	
Interest	3,550.25	
Bond interest paid	394,287.46	
Sundry accounts charged off	7,134.44	
		1,219,670.92
Balance, June 30, 1878		$283,423.98

During the year 85,000 new ties were laid and 23 miles of the main track renewed with steel rails, making 91½ miles now laid with steel. All renewals, etc., were charged to expenses.

Receiver Ingalls' report says: "Our arrangements for division of business and steady rates between Cincinnati and Chicago and Cincinnati and Indianapolis still continue, and the public are better accommodated and at less expense to the railroads.

"Our relations with all of our connections are harmonious. Our earnings for the coming year depend largely on what the trunk lines may do to establish and maintain fair rates. They own and control so many extensions through the West that almost absolute power to build up or destroy is in their hands. We have good crops and our local business will be good."

Northern Pacific.

This company owns and works the Minnesota Division, from Duluth, at the head of Lake Superior to Fargo, on the Red River of the North, 254 miles, of which 24 miles, from Duluth to Thomson Junction, are owned in common with the St. Paul & Duluth Company; the Dakota Division, which extends the line west 194 miles to Bismarck on the Missouri; the Pacific Division, from Kalama on the Columbia River in Washington Territory, 105 miles northward to New Tacoma on Puget Sound, with a branch from New Tacoma to Wilkeson in the Puyallup Valley, 31½ miles. It leases the Western Railroad of Minnesota, formerly known as the Brainerd Branch, from Brainerd, Minn., south to the St. Paul & Pacific at Sauk Rapids, 60½ miles, making 584½ miles owned and 645 miles worked. The history of the road is well known; the present company acquired possession through foreclosure some three years ago, and its report covers the year ending Aug. 31, 1878. The Western Railroad was leased from May 1, 1878, being then just completed; the rental is 35 per cent. of gross earnings, with a guarantee of 7 per cent. on bonds not to exceed $10,000 per mile.

The company has a great land grant, from which sales last year were very active; they are reported by the Land Department as follows:

	Acres.	Amount.
In Minnesota	84,840	$389,385.27
In Dakota	660,019	2,974,711.78
On Pacific Division	4,774	15,335.27
Town lot sales		9,245.00
Timber right sales		24,350.01
Total	749,633	$3,413,027.33

In payment of the above there was received $53,650.38 in cash and contracts, and $3,359,376.95 in preferred stock. There is reported extensive settlement on Government land within the boundaries of the grants, and the area of cultivated land near the line of the road is increasing very fast. Sales on the Pacific Division have been light, chiefly because preferred stock is not received for them, cash being required, and it is recommended that this limitation be removed.

The general account, condensed, is as follows:

Credit:	
Capital stock	$100,000,000.00
Assets acquired under decree of Court	44,968,370.26
Land receipts to July 31, 1878	5,046,636.18
Net earnings to "	1,176,192.69
Bills and accounts payable	278,011.76
Old claims, etc	49,743.31
Total	$151,518,954.20
Debtor:	
Preferred stock	$51,000,000.00
Less issued	43,011,267.42
Balance	$7,988,732.58
First mortgage bonds and interest surrendered	38,509,819.03
Preferred stock issued as collateral, etc	4,562,611.20
Common stock $49,000,000	
Less issued 26,122 300	
	22,877,700.00
Stock of old company surrendered	23,918,900.00
Common stock issued to complete subscription, etc	2,203,400.00
Preferred stock and scrip received for land sales	5,093,524.31
Construction and property accounts	20,759,342.21
Trustees of land stocks	735,000.00
Lands and coal lands	23,739,101.15
Connecting lines	606,951.82
Materials and receivables	155,547.03
Legal expenses, taxes, etc	247,977.44
Agents' and Treasurer's cash	120,347.43
Total	$151,518,954.20

Construction account was increased during the year by $124,461.13.

The earnings of the road were as follows, those of the Western Railroad being only for four months, from May 1:

	Minnesota Div.	Dakota Div.	Pacific Div.	Western R. R.
Passenger	$154,304.64	$89,992.88	$67,666.73	$19,131.22
Freight	515,504.99	179,041.96	49,012.70	36,057.28
Other	39,367.68	33,651.86	7,199.52	2,450.44
Total	$709,377.31	$302,686.70	$123,878.95	$57,638.94
Expenses	303,449.31	189,567.51	80,949.94	35,714.90
Net earn	$405,928.00	$113,119.19	$42,929.01	$21,924.04
Gross earn. per mile	2,792.81	1,560.24	907.54	952.71
Net earn. per mile	1,598.14	583.09	314.50	362.38
Per ct. of exps.	42.78	62.63	65.34	62.01

The earnings of the entire line were as follows, including in expenses $21,620.55 (not included above) for renewal of bridges and cars:

	1877-78.	1876-77.	Inc or Dec.	P. c.
Gross earnings	$1,193,381.90	$965,823.37	I. $227,558.53	23.6
Expenses	631,302.21	573,124.90	I. 58,177.31	10.2
Net earn	$562,079.69	$392,698.47	I. $199,381.22	43.1
Gross earn. per mile	1,975.80	1,746.52	I. 229.28	13.1
Net earn. per mile	935.95	710.12	I. 225.83	31.2
Per cent. of expenses	52.90	59.34	D. 6.44	10.9

The net earnings last year were 1.1 per cent. on the $51,000,000 preferred stock, or a little over one-half of 1 per cent. on the whole stock. During the year some two miles of new sidings have been built, 1,200 feet of pile bridge renewed and 525 tons new rails laid. On the Pacific Division several wooden structures have been filled in or replaced by stone culverts.

The disposition of earnings has been as follows:

Net earnings three years	$1,238,820.59
Old claims and organization expenses	$421,844.50
Construction of branch line	552,732.17
Coal machinery, wharves, etc	60,465.55
Permanent improvements of road	96,150.81
Taxes, legal expenses, interest, etc	107,627.56
	1,238,820.59

The development of the Puyallup coal mines has been slow, owing to faults and difficulties in the veins and mistakes in surveys. Explorations are being made looking to the extension of the Pacific Division into the valley of the Columbia over the Cascade Mountains.

Examination has been made of the country west of Bismarck, and an extension of 205 miles to the Yellowstone River is recommended. A branch to Pembina, to secure the Manitoba traffic, is recommended also; the length would be 150 miles through a good country. Reference is made to the dispute with the St. Paul & Pacific as to the use of its road as a St. Paul connection, and the board recommends that the company secure a controlling interest in the proposed new line from Sauk Rapids to Minneapolis. Complaint is made that the St. Paul & Pacific refuses to give this road any share of the Manitoba traffic, even carrying that bound to Duluth around by way of St. Paul.

A large part of the report is taken up by a statement of the failure of Congress to extend the company's limit of time for completion of the road, and the reasons for that failure.

LOCOMOTIVE RETURNS, JUNE, 1878.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

Name of Road.	Number of miles operated	Number of Locomotives in service	Mileage. Total	Mileage. Average per Engine.	No. Miles run to Ton of Coal	No. Miles run to Cord of Wood	No. Miles run to Pint of Oil	Average No. of freight cars hauled	Average cost per freight car per mile, cents	Cost per Mile in Cents for Repairs	Fuel	Stores	Miscellaneous	Engineers, firemen and wipers	Total	Average Cost of Coal per ton.	Average Cost of Wood per cord.
																$	$
Allegheny Val., River Div.*	139	41	81,758	1,994	42.94		29.56	24.10	0.719	4.98	3.21	0.43		6.32	14.94		
Low Gr'de Div.*	120	18	36,154	2,009	35.40		21.99	18.50	0.827	3.08	3.22	0.58		5.95	12.83		
Atlantic & Great Western, 1st & 2d Divs	228	83	210,156	2,544	48.06		18.24	17.70		2.98	4.25	0.43	0.66	5.88	14.21	1.93	2.82
3d & 4th Divs	197	50	123,340	2,467	36.60		30.48	15.70		4.44	4.68	0.31	0.69	5.47	15.59	1.62	2.82
Mahoning Div	88	51	113,598	2,227	44.48		21.09	18.00		4.08	4.48	0.37	0.49	5.48	14.90	1.87	2.82
Atlantic & Gulf	343	19	45,349	2,386		55.79	19.08			3.70	3.13	0.44		7.49	14.76		1.75
California Pacific	152	12	27,548	2,296	41.02		21.64			3.92	15.03	0.48	0.67	7.57	27.67	6.00	5.75
Cen. Pac., Western Div.†	227	57	141,184	2,477	41.09		16.52			6.96	14.84	0.52	0.60	7.79	30.71	6.00	5.75
Visalia Div.†	157	10	22,235	2,224	52.50		14.80			9.71	11.60	0.55	0.58	6.84	29.28	6.00	5.75
Tulare Div.†	171	11	24,030	2,185	46.41		12.73			3.15	13.11	0.62	0.13	7.88	24.89	6.00	5.75
Los Angeles, San Diego, Yuma & Wilmington Divs.†	408	16	42,952	2,685	63.48		15.38			6.39	9.65	0.52	0.04	7.63	24.23	6.00	5.75
Sacramento Div.†	120	35	75,840	2,167		29.58	16.31			5.69	19.44	0.51	0.40	9.29	35.33		5.75
Oregon Div.†	152	8	20,786	2,598	35.82	57.30	20.37			2.27	16.26	0.43	0.18	8.02	27.16	6.00	5.75
Truckee Div.†	205	24	58,674	2,445	40.37	32.48	17.74			4.58	16.24	0.45	0.52	8.75	30.54	6.00	5.75
Humboldt Div.†	201	17	45,402	2,671	48.97		21.81			9.09	12.46	0.38	0.44	7.69	30.06	6.00	5.75
Salt Lake Div.†	219	25	68,112	2,714	38.28		16.05			7.75	15.88	0.54	0.53	7.61	32.31	6.00	5.75
Chicago & Eastern Illinois‡	159	29	65,812	2,269	40.55		15.00			2.88	2.99	0.36		6 23	12 46		
Cleve., Col., Cin. & Ind., Columbus Div	138	57	156,930	2,753	47.67	74.42	30.30			3.61	3.53	0.45		6.54	14.13	1.55	2.75
Indianapolis Div	203	64	170,848	2,669	48.56	46.29	23.79			3.75	4.16	0.50		6.78	15.19	1.75	2.75
Cincinnati Div	130	34	79,067	2,325	46.01	43.77	20.91			2.49	3.77	0.58		6.63	13.47	1.55	3.50
Cleveland & Mahoning Valley	41	6	12,546	2,091	39.70		21.30	12.10		5.06	4.39	0.29	1.36	6.61	17.71	1.68	2.60
Cleveland & Pittsburgh*	225	78	165,483	2,122	51.04		19.91	17.30	0.801	3.25	2.65	0.42	2.12	6.31	14.75	1.20	3.10
Del., Lackawanna & Western, Bloomsburg Div.§	80	19	47,888	2,520			31.22			2.27		0.55		4.81	7.63		
Erie & Pittsburgh*	98	29	64,663	2,230	42.07		20.35	18.40	0.712	1.80	3.96	0.43	1.66	6.36	14.21	1.67	1.67
Grand Trunk, Portland Div		42	83,125	1,979	48.29			19.90									
Eastern Div		64	146,883	2,295				20.70									
Champlain Div		10	18,889	1,889	51.60			19.00									
Central Div		134	328,874	2,454	47.52			22.80									
Western Div		89	209,845	2,358	50.33			19.20									
Buffalo Div		25	64,627	2,585	54.75			18.70									
Detroit Div		18	50,472	2,804	31.75			19.60									
Houston & Texas Central	498	59	135,891	2,303	51.95	45.89	16.40			4.52	6.86	0.50	1.12	6.57	19.60	3.50	3.34
Ill. Cen., Chicago Div.¶	253	66	152,211	2,306	36.95		13.72	18.76		2.51	5.09	0.27		5.85	13.72	1.75	4.20
South Div.¶	231	29	63,030	2,173	43.74		16.14	15.82		4.55	4.29	0.29		5.79	14.92	1.75	4.20
North Div.¶	225	37	72,260	1,953	37.67		16.57	12.18		6.54	4.95	0.27		5.79	17.56	1.75	4.20
Springfield Div.¶	113	11	17,996	1,636	43.78		18.14	12.50		3.22	3.59	0.29		5.66	12.76	1.45	2.65
Iowa Div.¶	401	39	95,221	2,441	34.04		16.48	12.06		5.38	7.89	0.29		5.99	19.56	2.60	4.90
Jeff'nville, Madison & Ind's*	226	42	86,767	2,066	45.00	29.69	13.74	19.15	0.880	4.19	5.90	0.45	2.19	5.65	18.38	2.50	2.25
Kansas Pacific	721	65	165,056	2,539	28.88		12.35			7.47	11.20	0.45		6.57	25.69	3.25	3.06
Kansas City, St. Jo. & Council Bluffs**	271	31	86,573	2,793	62.10		28.80			4.50	4.60	0.30		6.60	16.00	2.65	3.50
Lake Shore & Mich. Southern, Buffalo Div.‡		89	178,000	2,001	43.32	45.35	24.51			3.95	6.97	0.27		5.80	17.01	2.85	5.69
Erie Div.‡		113	205,766	1,820	38.75		28.79			4.36	6.87	0.36		5.82	17.33	2.52	5.43
Toledo Div.‡		85	123,811	1,456	31.79	58.81	21.29			3.87	9.11	0.33		5.86	19.19	2.92	4.08
Mich. Southern Div.‡		208	352,428	1,694	43.50	66.11	26.60			4.69	7.62	0.29		5.89	18.39	3.35	4.63
Little Rock, Miss. River & Tex.	100	4	5,142	1,286		76.00	13.00			4.70	2.90	0.50	2.70	9.10	19.90		2.25
Louisv'e & Nash., First Div.‡	332		109,049	2,117	31.75	38.00	12.37			5.40	6.37	0.43	1.93	7.02	21.15	1.95	2.51
Second Div.‡	200		77,014	2,117	34.50		13.68			4.17	5.40	0.43	1.65	6.02	17.67	1.82	2.77
Memph. Div.‡	131		38,233	2,117	41.50		12.70			3.85	6.69	0.44	1.91	6.36	19.25	2.74	2.85
Nashville & Decatur Div.‡	122		36,138	2,117	35.50		14.26			3.96	6.93	0.52	1.66	5.95	19.02	2.38	3.00
S. & N. Alabama R. R.‡	183		50,793	2,117	36.25		12.29			5.41	5.95	0.64	1.51	6.37	19.88	2.06	2.00
Marq., Houghton & Ontonagon	88	25	32,780	1,311	41.57		26.02	72.37		1.37	10.02	0.45		5.88	17.72	4.00	
Northern Central, Elmira & Canandaigua Divs	147	46	109,255	2,375	35.78		20.83			4.65	5.21	0.60		5.90	16.36	1.80	2.00
Penn., New York Div.††	120	119	275,448	2,315	38.54		11.44			4.50	8.50	0.80			13.80	3.20	4.88
Amboy Div.††	154	39	72,195	1,851	57.45		22.12			5.10	5.70	0.40			11.20	3.20	4.91
Belvidere Div.††	103	33	52,518	1,591	40.42		17.30			3.40	8.10	0.60			12.10	3.20	4.90
Philadelphia Div.††	191	146	367,122	2,515	28.94		15.77			4.40	4.40	0.60			9.40	1.20	2.72
Middle Div.††	132	92	262,332	2,851	33.36		19.23			5.20	3.80	0.50			9.50	1.20	2.72
Pittsb'h Div.††	221	174	403,080	2,316	29.18		13.77			7.90	4.20	0.60			12.70	1.20	2.72
Tyrone Div.††	107	28	53,993	1,928	21.78		25.13			11.60	5.60	0.40			17.60	1.20	2.74
West Penn. Div.††	104	21	43,471	2,070	44.21		39.06			10.60	2.80	0.30			13.70	1.20	2.72
Lewistown Div.††	56	5	8,622	1,724	41.22		21.74			0.30	3.00	0.50			3.80	1.20	2.74
Bedford Div.††	57	3	8,626	2,875	38.18		28.72			6.30	3.20	0.30			9.80	1.20	2.86
Pitts., Fort Wayne & Chicago, Eastern Div.*	371	150	349,238	2,328	46.88		18.56	16.80	0.750	2.31	2.88	0.45	1.97	6.28	13.89	1.35	1.35
Western Div.*	280	102	264,682	2,580	42.30		17.30	24.50	0.542	3.59	3.85	0.37	2.73	5.92	16.46	1.63	1.63
Pitts., Cin. & St. Louis, Little Miami Div.*	197	39	91,581	2,348	47.71		12.74	16.10	0.862	5.32	4.49	0.51	2.17	5.64	18.13	2.10	2.00
P., C. & St. L. Div.*	224	89	218,140	2,451	33.14		21.40	20.06	0.740	6.50	2.37	0.38	3.13	5.66	18.04	0.71	2.50
Pittsb'gh, Titusville & Buffalo*	158	23	40,470	1,760	56.12		19.86	15.80	1.349	4.73	3.02	0.53		5.96	14.24		
St. Louis, Iron Mt. & So., Arkansas Div	325	32	75,860	2,371		47.70	14.50			3.33	5.24	0.56		6.38	15.51		2.50
St. Louis & San Francisco	328		70,579		41.70		15.40			2.52	5.11	0.30		5.72	13.65	2.15	1.80
St. Louis & S. E., St. L. Div	208		53,542		46.00		21.30			3.99	2.40	0.24		5.65	12.28	1.00	
Nashville Div	145		52,408		33.60		16.60			3.95	2.30	0.29		6.03	12.57	0.74	
Stockton & Copperopolis	49	2	3,798	1,869	41.02		21.64			39.89	17.24	0.77	0.74	9.72	68.36	6.00	5.75
West Jersey††	128	18	39,411	2,190	72.52		22.62			3.10	7.20	0.50			10.80	3.80	4.26
Nine months ending June 30:																	
Louisville, Cin. & Lexington‡‡			693,085		36.77		12 50			4.42	7.20	0.54	2.55	6.13	20.84		

* Five empty cars rated as three loaded ones.
† Switching engines allowed 6 miles per hour; helping engines, actual distance run and 4 miles per hour while waiting trains.
‡ Switching engines allowed 6 miles per hour. § Fuel not estimated.
‖ Switching and work-train engines allowed 6 miles per hour; no switching mileage allowed to train engines.
¶ Two empty cars rated as one loaded one. ** Three empty cars rated as two loaded ones.
†† Engineers', firemen's and wipers' wages not included in cost per mile run.
‡‡ Ton of coal is 2,240 lbs.
The ton of coal is 2,000 lbs., unless otherwise noted: 25 bushels counted to the ton.